1948

A comprehensive traffic survey for the city of Rolla, Phelps County, Missouri

Leon Hershkowitz

Department:

A

COMPREHENSIVE TRAFFIC SURVEY

FOR

THE CITY OF ROLLA

PHELPS COUNTY

MISSOURI

BY

LEON HERSHKOWITZ

A

THESIS

submitted to the faculty of the

SCHOOL OF MINES AND METALLURGY OF THE UNIVERSITY OF MISSOURI

in partial fulfillment of the work required for the

Degree of

MASTER OF SCIENCE IN CIVIL ENGINEERING

Rolla, Missouri

1948

Approved by E. W. Carlton

Professor of Civil Engineering

ACKNOWLEDGMENT

The writer wishes to express his sincere appreciation to Professor E. W. Carlton of the Civil Engineering Department, Missouri School of Mines, for suggesting the problem and for his valuable advice and criticisms.

Sincere thanks are due to Col. Robert C. F. Goetz of the Eno Foundation for his generosity in providing material for the introduction; also the many students of the School of Mines who participated in obtaining the traffic data used herein.

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INTRODUCTION

The ultimate aim of this comprehensive traffic survey for the city of Rolla, Phelps County, Missouri, is to furnish a guide or pattern together with the necessary forms, maps and charts, that can be followed and reproduced by any city having a population of less than 10,000 in a study to determine its particular traffic problems. This survey should serve as a guide in determining what corrective action can be taken in connection with the following:

(1) The improvement of location of state highway trunk routes, by-pass routes, auxiliary routes, and county roads in the city's immediate area.

(2) The selection and improvement of city streets that are related to highway routes, by-pass routes, auxiliary routes and county roads.

(3) The improving and coordinating the city's transportation system in general.

(4) Suitable parking methods or areas in the congested business district.

A comprehensive traffic survey of this type can be accomplished at a cost which would be quite negligible insofar as the city's finances are concerned.

Because of the limited finances of small cities, the majority of the State Highway Departments, in connection with the Public Roads Administration, Federal Works Agency, are

cooperating with cities having a population over 10,000 in determining their traffic problems.

It is quite apparent that many cities having a population less than 10,000 are also faced with pertinent traffic problems, due no doubt, to the increased interstate traffic and which cannot be intelligently analyzed without the aid and guidance of a comprehensive survey.

The fact that traffic problems truly exist in small towns is becoming more apparent every day. One need only observe the traffic situation in a particular community in order to be convinced that all is not what it should be and something should be done to better the conditions.

The fact that problems do exist in small towns and that some corrective action should be taken is best expressed in the following:(1)

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(1) An article entitled "Small Town Traffic" by Col. Robert C. F. Goetz, from January 1948 Traffic Quarterly, Published by the Eno Foundation.

"If you are fully acquainted with traffic news and traffic literature you might easily gain the impression that urban traffic problems are the most pressing. If you are only reasonably well informed on its broader aspects you will recognize that the problem is critical and rational.

"There are some good reasons for the over-emphasis of the city problem. Organized interest, direct effort, profes-

sional advice and funds have succeeded in placing their problem in an understandable light within the mental grasp of those previously uninformed. Their efforts have stimulated interest and led to partially corrective measures.

"The problem of the small town is different but not less important. Traffic problems can be as acute on Main Street as on Broadway, the driver attitude is much the same, or if any different, let us say, less professional. The reasons for the small town problem are not unlike those for the city-antiquated roads of another era, growing business and industry and the concentrated shopping districts.

"Most small towns grow without the benefit of planning. Some are civic minded and progressive, appreciating their responsibilities, anticipating their needs and endeavoring to meet them. This is not true of traffic. Small towns have become the bottlenecks of suburban and rural motor travel.

"Many are lacking in knowledge and complacent in their efforts to meet their traffic problems. With the mounting flow of traffic and their wishy-washy methods they inescapably find themselves submerged in a conflict of individual and selfish interests with a donothing policy. Eventually they become something to be avoided and finally stagnate. Many residents of the community fully appreciate that their traffic problem is intolerable and inexcusable as a result of poor management. Ironically, they, or an influential portion of them, are the first to oppose a logical change.

"In these days of rapid travel and communication there is not much excuse for a form of municipal government or administration that continues to tolerate such chaotic traffic conditions, blind to its disadvantages and inefficiency and insensible to the contempt of the citizens of the community and the increasing wrath of those whose limited itinerary compels them to motor through it.

"The ineffectual and haphazard small town methods now in vogue are bewildering to the conscientious effort and best intent of the law-abiding part of the motoring public striving to be good drivers."

There is no doubt that the traffic conditions of a small city are becoming more acute each day. Motor vehicles are increasing in number and are becoming more efficient far in advance of rural and urban road and street facilities that will accommodate them. This unbalanced situation will most likely continue. Traffic problems in small cities will steadily grow worse unless some corrective action is taken and no intelligent corrective action can be taken without the aid and guidance of a comprehensive survey.

The survey for the city of Rolla will consist of three parts. Part I will deal with the external survey, taking into consideration all types of vehicles entering and leaving the city from 7:00 a.m. to 5:00 p.m. every quarter-hour period, Monday through Friday. Part II will deal with the internal portion of the survey. This portion of the survey

will determine the trend of traffic within the city limits from 7:00 a.m. to 5:00 p.m., Monday through Friday. Part III will deal with various locations throughout the city and recommendations for their improvements.

PART I

The External Survey

CHAPTER I

Preliminary Arrangements

The external survey is made for the prime purpose of determining the amount of traffic entering and leaving the limits of the particular city involved.

The preliminary arrangements must be made with great care in order that the ultimate survey will serve its purpose.

First of all, the time the survey is to be made must be determined well in advance in order to give a maximum amount of time for working out detailed arrangements. The survey must have the whole-hearted support of the entire city if it is to be a success. In order to attain this support you must sell the city on the merits of a comprehensive survey and convince them that the survey is necessary and that it will be a vital factor in determining future improvements.

After the Mayor and city officials have pledged their support and several weeks before the survey is to begin, a vigorous publicity campaign should be started and continued until the survey is completed.

Speakers should appear before civic groups, local newspapers should be supplied with and present to their reading public all facts pertaining to the coming survey (See Plate I).

ROLLA DAILY NEWS

HERSKOWITZ'S TRAFFIC SURVEY TO START MAY 1

Leon Herskowitz, graduate student at the School of Mines, is planning a complete traffic survey for Rolla as his graduate study theisis here. The survey, described as a "$10,000 job," will be made at no cost to the city, but will require some voluntary assistance, Herskowitz explained to the Chamber of Commerce luncheon group here.

The survey will begin about May 1, Herskowitz said, with students taking the count, together with volunteer civic workers who will be asked to donate one shift of 2½ hours to the job.

Some of the counting will be done at 18 key stations in and around Rolla, while other "counting" will be done by calling at homes and interviewing motorists. So, if someone calls at your home "with credentials" and starts asking such questions as "Where did you go in your car yesterday" and "What streets did you travel?" you will understand that it is probably not the FBI or some nosey person asking unauthorized questions.

Herskowitz said that after the survey is made Rolla will know just where the traffic is going, where the "battlenecks" are located and the type of traffic predominating.

Such a survey as planned here would cost the city $10,000 to hire it done by professional engineers, according to Prof. E. W. Carlton, who introduced Herskowitz. Carlton and Prof. Joe B. Butler, head of the department, both emphasized the need for such a survey.

Rolla Traffic Survey To Be C of C Topic

The possibility of a complete traffic survey of Rolla's streets and highways will be the subject of a talk at the weekly Chamber of Commerce meeting tomorrow in the College Inn of the Hotel Edwin Long.

Leon Hishkowitz, civil engineer of the School of Mines, will be the principal speaker, P. H. McGregor, Secretary, said today.

Hishkowitz will discuss Rolla's traffic and street problems and recommend various types of solutions.

THE ROLLA DAILY NEWS

TRAFFIC SURVEY FOR ROLLA IS PLANNED AT NO COST TO THE CITY

Leon Hershkowitz of MSM Will Supervise Work, Aided by Business Men and Students

Plans for a comprehensive traffic survey of Rolla, both of vehicles going in and out of Rolla as well as the movement of cars within the city itself, were disclosed by Leon Hershkowitz, instructor at the Missouri School of Mines, at Wednesday's meeting of the Chamber of Commerce.

The survey will be supervised by Mr. Hershkowitz as a part of his graduate work at no cost to the city. If, however, the work was done by professional engineers brought in from outside, it would cost from some $10,000 to $12,000.

Professor Joe B. Butler and E. W. Carlton of MSM explained the benefits which would be derived from such a survey.

Hershkowitz, who has had nearly ten years training in highway engineering, pointed out that the traffic situation in Rolla, as in other growing cities of comparable size, was not going to get any better, and undoubtedly would get somewhat worse if correction action is not taken.

Without results from such a survey, the city would be at a loss to proceed intelligently in improving traffic problems.

The survey, Hershkowitz said, will probably start the first week in May. Business and professional men will be asked to donate two and a half hours of their time to assist, as will a number of students at the School of Mines.

Interviews will be made at the homes of motorists, and it was urged that all residents cooperate with Hershkowitz and his staff in facilitating the work of the survey.

THE ROLLA HERALD, THURSDAY, APRIL 1, 1948

Plate I
PUBLICITY

If your city is fortunate enough to have a radio broadcasting station make a special effort to have an account of the survey inserted during news-broadcasting periods.

The next item to be considered is the number and location of stations where traffic will be counted. Using any available map of your particular city, establish a station at every point where traffic enters and leaves the city via state and county highways. For the external survey of Rolla, stations were established as follows: (See Plate II)

Station No. 1 Intersection U.S. 66, U.S. 63, and 6th St.
Station No. 2 Intersection U.S. 66 and 14th Street
Station No. 3 Intersection U.S. 66 and Vichy Road
Station No. 4 Intersection U.S. 66 and Pine Street
Station No. 6 Intersection Holloway and 10th Streets
Station No. 7 Intersection Salem and Soest Roads
Station No. 8 Intersection Salem Road and U.S. 72
Station No. 9 Intersection U.S. 72 and Rolla Street
Station No. 10 Intersection U.S. 72 and U.S. 63

It will be noted that the above stations include all important traffic entering and leaving Rolla over state and county highways.

The type of tally sheet to be used for the counting of vehicles must next be determined. The one most commonly used is shown by Plate III. It will be noted that this is a four corner type of tally sheet wherein traffic has the possibility of twelve different movements. If less than four corners are encountered appropriate sections can be crossed out. It

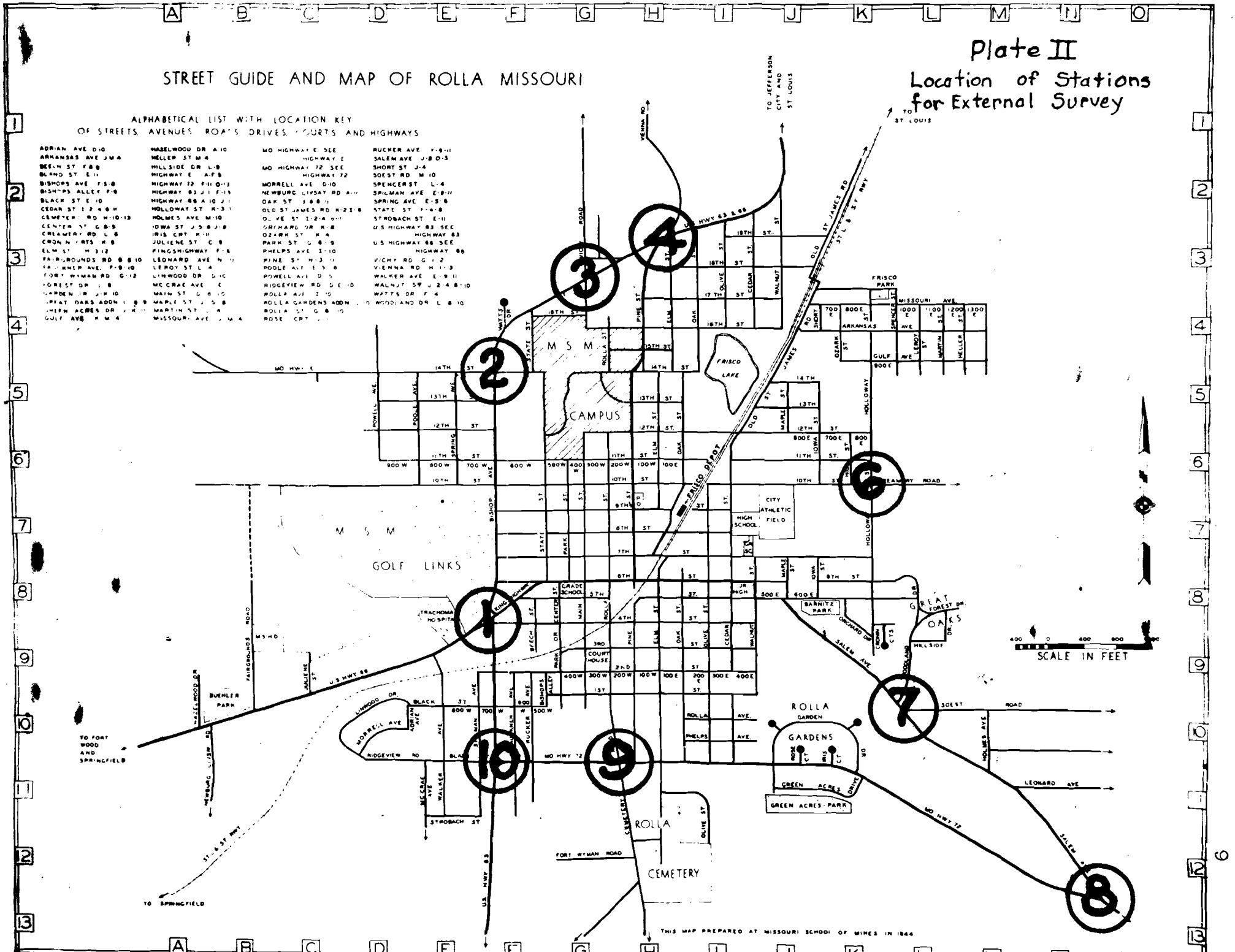
Plate II

Location of Stations for External Survey

STREET GUIDE AND MAP OF ROLLA MISSOURI

ALPHABETICAL LIST WITH LOCATION KEY
OF STREETS, AVENUES, ROADS, DRIVES, COURTS AND HIGHWAYS

ADRIAN AVE D-10
ARKANSAS AVE J-M-4
BEECH ST F-8-9
BLAND ST E-11
BISHOPS AVE F-5-8
BISHOPS ALLEY F-9
BLACK ST E-10
CEDAR ST I-2-4-6-8-11
CEMETERY RD M-10-13
CENTER ST G-8-9
CREAMERY RD L-8
CRONIN TERRS K-8
ELM ST M-3-12
FAIRGROUNDS RD B-8-10
FAIRGROUNDS AVE. F-8-10
FORT WYMAN RD G-12
FOREST DR L-8
GARDEN DR J-K-10
GREAT OAKS ADDN L-8-9
GREEN ACRES DR J-K-11
GULF AVE K-M-4
HAZELWOOD DR A-10
HELLER ST M-4
HILLSIDE DR L-8
HIGHWAY E A-F-8
HIGHWAY 72 F-11-O-13
HIGHWAY 63 J-L-F-13
HIGHWAY 66 A-10-J-L
HOLLOWAY ST K-3-7
HOLMES AVE M-10
IOWA ST J-5-8-J-8
IRIS CRT K-11
JULIENE ST C-8
KINGSHIGHWAY F-8
LEONARD AVE N-11
LEROY ST L-4
LINWOOD DR D-10
MC CRAE AVE E
MAIN ST G-8-10
MAPLE ST J-5-8
MARTIN ST L-4
MISSOURI AVE J-M-4
MO HIGHWAY E SEE HIGHWAY E
MO HIGHWAY 72 SEE HIGHWAY 72
MORRELL AVE D-10
NEWBURG LIPSAY RD A-11
OAK ST J-8-11
OLD ST JAMES RD K-2-1-8
OLIVE ST I-2-4-6-11
ORCHARD DR K-8
OZARK ST K-4
PARK ST G-8-9
PHELPS AVE I-10
PINE ST H-3-11
POOLE AVE E-5-8
POWELL AVE D-5
RIDGEVIEW RD D-E-10
ROLLA AVE I-10
ROLLA GARDENS ADDN I-10
ROLLA ST G-8-10
ROSE CRT J-11
RUCKER AVE F-8-11
SALEM AVE J-8-D-3
SHORT ST J-4
SOEST RD M-10
SPENCER ST L-4
SPILMAN AVE E-8-11
SPRING AVE E-5-8
STATE ST F-4-8
STROBACH ST E-11
U.S HIGHWAY 63 SEE HIGHWAY 63
U.S HIGHWAY 66 SEE HIGHWAY 66
VICHY RD G-12
VIENNA RD H-1-3
WALKER AVE E-9-11
WALNUT ST 59 J-2-4-8-10
WATTS DR F-4
WOODLAND DR L-8-10



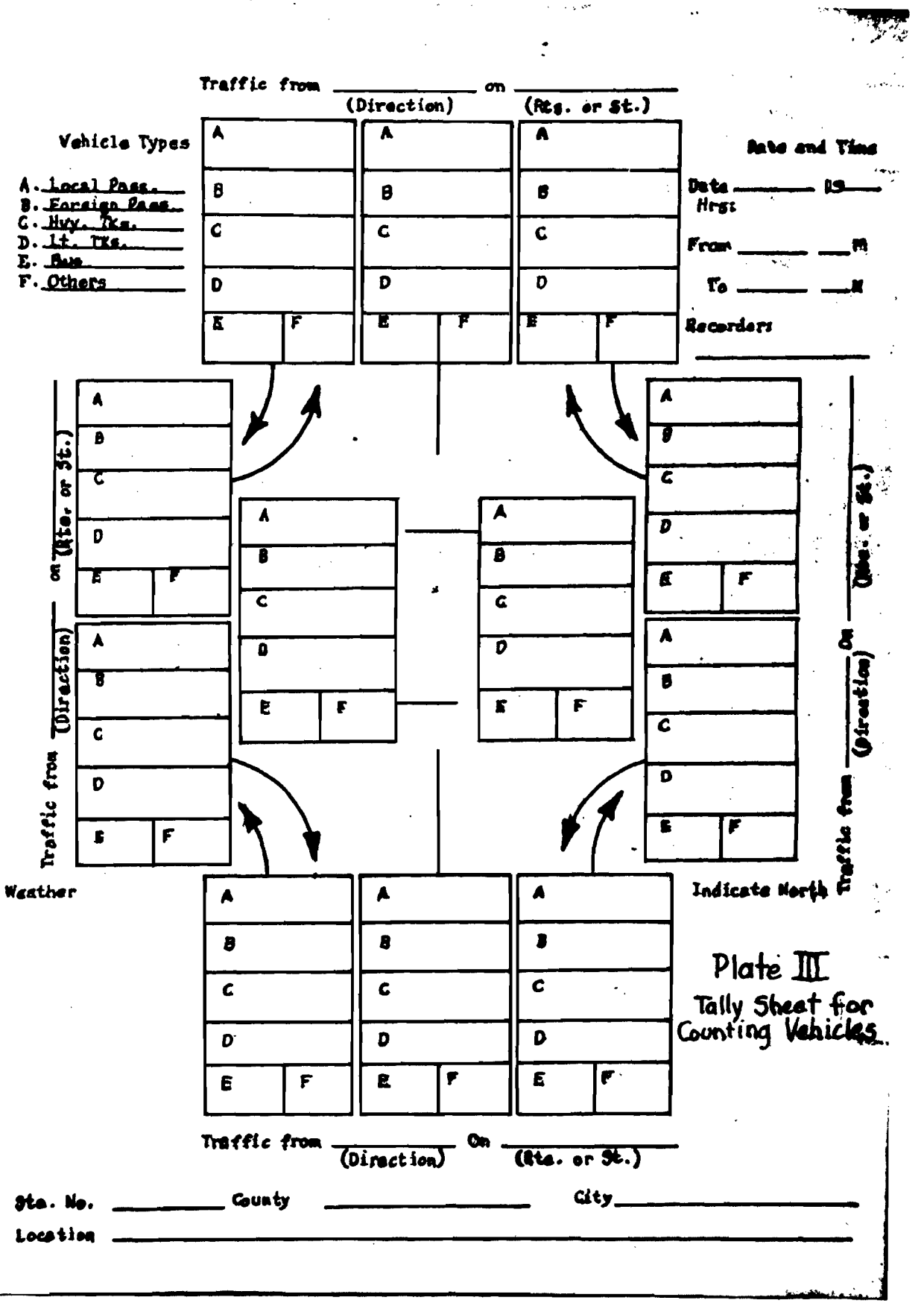


Plate III
Tally Sheet for Counting Vehicles

can further be noted that this type of tally sheet can segregate traffic into several groups--foreign (out of state) passenger cars; local (state) passenger cars; heavy trucks; light trucks; busses; and others; as was done in the Rolla survey. Semi-trailer vehicles were considered heavy trucks, all others light trucks. Others included motorcycles, motor scooters, bicycles, horse-drawn vehicles, etc. It is most important that all information called for on the tally sheet be provided, particularly the direction and route or street vehicles enter and leave the intersection, the time count was made and an arrow inserted indicating north.

It should be decided upon how long a period the traffic count shall be taken, that is, how many hours during the day and how many days during the week. For the purpose of the Rolla Survey, it was decided to run the survey 5 days, Monday through Friday, and daily from 7:00 a.m. to 5:00 p.m. Saturdays, holidays, and other nonrepresentative days should be omitted, as they are not characteristic of the entire week.(2)

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(2) Manual of Procedure for Traffic Studies, Public Roads Administration, Federal Works Agency

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The most important and difficult phase of the preliminary arrangements is that of mustering enough personnel to actually count vehicles. If the publicity campaign has served its purpose, civic minded individuals should be available as counters. Entire groups should be contacted, such as the

Chamber of Commerce, Boy Scouts, High School students, women's organizations, etc. A convenient form for listing personnel is shown by Plate IV, the perpendicular column showing the stations, the horizontal column showing the hours to be counted. A separate sheet is used for each day of counting. The names of those counting should be inserted opposite the stations and under certain hours. Plate IV should be entirely filled for each day of the survey, every station and every hour for each day of the survey must be accounted for.

The number of personnel required for counting will vary with the number of stations selected. The more important stations should be counted by a team of two, one person at the least important stations is sufficient. It has been found that the best results are obtained if counters work no longer than two hours at a time.

A summary of the personnel used for the Rolla External Survey is as follows:

Day	Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 6	Sta. 7	Sta. 8	Sta. 9	Sta. 10	Total
Mon.	7	8	7	10	7	5	4	4	9	61
Tues.	7	7	6	5	3	3	3	3	5	42
Weds.	9	11	9	12	8	7	6	7	9	78
Thur.	10	10	10	10	5	5	5	5	10	70
Fri.	11	12	10	12	6	6	6	7	10	80
Total	44	48	42	49	29	26	24	26	43	331

PLATE IV
Personnel Record

WEDNESDAY

STA.	HOURS										
	7 — 8	8 — 9	9 — 10	10 — 11	11 — 12	12 — 1	1 — 2	2 — 3	3 — 4	4 — 5	Remarks
1											
2											
3											
4											
6											
7											
8											
9											
10											
14th											
12th											
11th											
10th											
9th											
8th											
7th											
6th											

Total number of hours 7:00 a.m. to 5:00 p.m. = 10

Total number of Stations = 9

Total number of Station hours per day = 90

Total number of Days = 5

Total number of Station Hours for 5 Days = 450

Average time each personnel counted = $\frac{450}{331}$ = 1.36 Hours

It can be seen by the above tabulations that the average time each person counted vehicles was approximately 1 hour and 22 minutes, however, some remained at their stations as long as four continuous hours. Station numbers 6, 8, and 9 were taken care of by one counter, whereas station numbers 1, 2, 3, 4, and 10 were taken care of by two counters.

After the personnel are selected it is most important that each individual be fully instructed as to his or her exact duties. This should be accomplished one or two days prior to the actual counting. They should be shown the tally sheets and instructed as to how to make the count. All information called for on the tally sheets should be complete. If the count is to be made for 15 minutes, 30 minutes or one hour intervals, make sure that each individual understands that one tally sheet only is to be used for that period selected. Be sure that all counters know exactly where their stations are located and understand when they will be relieved and have it definitely understood that they should stay at their stations until they are relieved. In spite of all completely prepared arrangements certain difficulties will arise during the actual counting; someone may be called out

of town the last minute, another may be taken ill unexpectedly, still another may have important personal business to complete. It is for these unexpected eventualities that a pool of counters should be created to take over any station on a moment's notice. This pool of counters is in addition to those already selected for the entire survey. The counters should know exactly where and when to pick up and return their tally sheets. It is important that some individual check each station twice in the morning and twice in the afternoon to make certain that all stations are being properly counted.

If the survey is to start on a Monday, as did the Rolla Survey, it is well to check out clip boards and tally sheets (enough to last for the entire day) to the individual counters on the previous Saturday. In this manner the counters need only go direct to their respective stations and begin their work. Those who are to relieve the previous counters can also go direct to their respective stations and take over. If the survey continues until 5:00 p.m., as did the Rolla Survey, those counting up to that time should return their tally sheets and clip boards to a central clearing point as soon after 5:00 p.m. as convenient in order that the 7:00 a.m., Tuesday, counters can be supplied the previous evening. This system should continue throughout the entire week of counting.

CHAPTER II

The External Count

The field work for the external portion of the survey was completed with a great deal more success than was anticipated. Practically ninety per cent of the stations were counted with no interruptions. Weather conditions were ideal with the exception of one day, Wednesday, May 5, 1948 during which time intermittent showers were encountered. However, the survey proceeded during the showers as it was possible for the counters at all stations to get under cover and keep dry.

The primary purpose of the external survey was to determine: (1) the number of vehicles entering and leaving the city of Rolla every 15 minute period, from 7:00 a.m. to 5:00 p.m., and how this number of vehicles affected the traffic conditions within the city proper; (2) information was desirable pertaining to the possibility of relocating U. S. 66 and how it would affect the number of vehicles coming into Rolla; (3) what day of the week, with the exception of Saturday, could Rolla expect its peak traffic.

As was expected, the traffic peaks during the day came at the usual hours 7:45 to 8:00 a.m.; 12:00 to 12:15 p.m.; 12:45 to 1:00 p.m.; and 4:00 to 4:30 p.m., as can be seen by figures 1 to 15 inclusive. However, definite peaks, in some cases, are difficult to determine, as vehicular traffic in small cities is somewhat irregular.

From Table I, which is a recapitulation of Tables III to VII inclusive, the following results were obtained:

Stations 1, 4, and 10 (See Plate I) carried the bulk of the traffic entering and leaving Rolla for the entire week period, it being 75% of the total, this of course, was to be expected, as these are the major stations involved. It can also be seen that the break-down as to the type of vehicles concerned are as follows:

Local (Missouri Passenger Cars)..... 60%

Foreign (Out of State Passenger Cars)..... 13%

Light Trucks..... 19%

Heavy Trucks..... 6%

Others..... 2%

As was previously explained, heavy trucks consisted only of the large semi-trailer vehicles and the 6% which appears above seems quite insignificant and out of line; however, this amounts to almost 900 vehicles of this type per day.

The light trucks, which included all other types, consisted of 19% or a total of 25% for all types of trucks. This amounts to about 3600 trucks per day entering and leaving Rolla, passenger cars, both foreign and local, make up a total of 75% or 10,700 vehicles per day entering and leaving Rolla. This accounts for the fact that every third car passed on the highway is some type of truck.

There has been considerable controversy from time to time as to the value of having U.S. 66 routed through Rolla.

VEHICLES ENTERING ROLLA

(Monday through Friday)

Sta.	Local	For-eign	Heavy Trucks	Light Trucks	Others	Total Vehicles	%
1	6779	1986	770	2018	167	11720	32
2	1206	66	40	445	33	1810	5
3	443	30	34	125	28	660	2
4	5388	2555	792	1629	180	10544	28
6	547	10	31	129	16	733	2
7	1629	42	91	439	159	2360	6
8	1778	58	69	642	121	2668	7
9	1135	39	69	259	40	1522	4
10	3219	174	338	1196	83	5010	14
Total	22124	4980	2234	6862	827	37027	100
%	60	13	6	19	2	100	

VEHICLES LEAVING ROLLA

(Monday through Friday)

1	6569	2420	909	2171	187	12256	35
2	1187	110	43	415	35	1790	5
3	412	33	21	134	48	648	2
4	4668	2162	628	1393	133	8984	26
6	348	10	11	84	17	470	1
7	1487	35	66	349	74	2011	6
8	1635	74	75	629	34	2445	7
9	1041	29	56	236	37	1401	4
10	3026	174	326	1242	74	4864	14
Total	20383	5049	2145	6655	639	34869	100
%	59	14	6	19	2	100	

TABLE I

Table II gives some very interesting information on this subject.

For Monday, 6703 vehicles entered Rolla and 6108 departed, giving a difference of 595; of this total, 15% or 89 vehicles were foreign, deducting 10% as belonging to local students, 80 vehicles can be assumed to have spent the night in Rolla.

Tuesday, Wednesday, and Thursday were 95, 54, and 65 respectively, and Friday having a minus number of 3. This amounts to 294 vehicles for 5 days which can be assumed to have spent the night in Rolla. Further assuming that each vehicle carries an average of 3 passengers, Rolla can expect the following income:

Lodging	$2.00 x 3	=	$6.00
Meals			
Dinner	1.25 x 3	=	3.75
Breakfast	0.75 x 3	=	2.25
Miscellaneous			
Gas, oil, etc.		=	4.00
	Total		$16.00

Right! they aren't are not equal, prof.!

16 x 294 = 4704 x 52 = $244,608.00

In other words, the number of vehicles making Rolla an overnight stop can be assumed to spend over a quarter of a million dollars during the year and this can be considered a very conservative estimate as Saturdays and Sundays are not included.

NUMBER OF VEHICLES MAKING ROLLA AN OVER-NIGHT STOP

(Note last column)

	Entering Rolla	Leaving Rolla	Difference	15% Foreign	10% Student Cars
Monday	6703	6108	⁄595	⁄89	⁄80
Tuesday	7619	6908	⁄711	⁄106	⁄95
Wednesday	8059	7662	⁄397	⁄60	⁄54
Thursday	7309	6828	⁄481	⁄72	⁄65
Friday	7337	7363	-26	-4	-3

TABLE II

It is also interesting to note from Table II that the peak day of traffic through Rolla was Wednesday, however, this day was also the low for the number of vehicles spending the evening. The exact opposite is true for Monday. The fact that Friday indicated a minus number of vehicles can be explained by the traveling public desiring to reach their destinations for over the coming week-end, thereby passing up Rolla. Table II further indicates that Tuesday is the night Rolla can expect its peak in overnight stops.

Referring again to Table I, it is interesting to note that between stations 1 and 4, the southwest and northeast outlets of Rolla, the latter has the greater number of vehicles passing through it, 32% as against 28% entering Rolla and 35% as against 26% leaving Rolla. This would probably indicate that as a business proposition, one would be more wise to locate along Route U.S. 66 southwest of Rolla, rather than northeast.

Station 8 is the fourth in importance as to the amount of traffic entering and leaving Rolla. This station carried 5113 vehicles for the 5-day period or 7% of the total traffic. This amounts to an average of 1022 vehicles per day, 69% being local and foreign passenger cars, 27% being all types of trucks, and 4% others; the ratio being slightly over two passenger cars to one truck.

Stations 7, 2, 9, 6, and 3 carried 6%, 5%, 4%, 2%, and 2% respectively, or a total of 19% of entire amount of

traffic entering and leaving Rolla. This amounts to approximately one-fifth of the traffic of all stations.

CHAPTER III

Conclusions

The most important conclusion that can be stated is in regard to the re-location of Route U.S. 66 around Rolla.

On the surface it would appear that business interests in Rolla would stand to lose a considerable amount of money, as shown by data in Chapter II, if U.S. 66 were to be re-routed and by-pass Rolla 2 to 4 miles.

One must consider this problem on a broad plane, taking into consideration the traveling public as well as the local interests and ever remembering that U.S. 66 is and will continue to be the most important thoroughfare in the United States.

This vital highway is a very important cog serving a vast amount of vehicular traffic from the eastern section of the United States, through the mid-western portion thereof, and finally linking the far west. The individuals who use this roadway must be rightfully considered. It is the responsibility of those who have the authority insofar as the location of U.S. 66 is concerned to see that it is located in such a manner as to be a most economical time saver consistent with sane driving speeds. The across-country driver should not be penalized by having to drive through every city and village if he does not choose to do so. It is a fact that small communities have been and are becoming more so every day, bottlenecks to through traffic. Large

metropolitan areas have been cognizant of this condition, and have made much progress toward alleviating the situation, and this they will continue to do in the future. Small communities have a long way to go toward accomplishing this end.

One must also consider important through highways in regard to future military service. We were confronted in the past and will, no doubt, in the future see an inadequacy of railway transportation, causing our highway transportation system to carry a tremendous load. This important function must not be jeopardized in any manner by a slowing down process created by highways being located through small communities.

In my opinion, business interests in Rolla will not lose an appreciable amount if U.S. 66 were re-located 2 to 4 miles further away from its present location.

Rolla has, over a period of years, gained an enviable reputation as a desirable stopover, not only for those who desire to take advantage of the recreational facilities afforded by this unique Ozark region but in addition those who are making cross-country trips. For this reason Rolla will not be materially affected if U.S. 66 were to be re-located in such a manner that it would miss the immediate environs of the city.

Rolla will always be available to those who desire to make a local stopover. Various high type access roads will

act as feeders for that traffic approaching from the northeast or southwest. The present location of U.S. 66, southwest and northeast of Rolla, and Missouri Highway "E", will continue to serve the city regardless as to where the ultimate location of U.S. 66 will be, and in addition 10th Street to the west and Vichy Road to the north would be extended and improved to meet future demands.

On the other hand, those who desire to continue on will not be discommoded by being compelled to drive through this or any particular community.

Surely that vast majority of highway users and the welfare of our country should be considered more than local business interests. Therefore, it is my contention that all small communities, and in particular Rolla, should be by-passed.

In regard to vehicles entering Rolla affecting traffic conditions within the city itself, no particular problem exists. The movement of vehicles in and out of Rolla is very uniform throughout the day, true, outside traffic will tend to add a little more fuel to the fire but the problem here can be remedied by the city administration. This will be further discussed in Part II, The Internal Survey.

VEHICLES ENTERING ROLLA (Monday)

Sta.	Local	Foreign	Heavy Trucks	Light Trucks	Others	Total Vehicles	%
1	1229	320	133	318	34	2034	30
2	198	18	6	89	12	323	5
3	68	5	9	15	6	103	2
4	1120	583	126	296	38	2163	32
6	178	1	16	35	6	236	4
7	77	0	1	20	3	101	1
8	312	14	7	138	10	481	7
9	216	5	10	45	7	283	4
10	634	36	130	158	21	979	15
Total	4032	982	438	1114	137	6703	100
%	60	15	6	17	2	100	

VEHICLES LEAVING ROLLA (Monday)

1	1048	489	126	276	38	1977	32
2	245	18	5	89	13	370	6
3	73	7	6	21	27	134	2
4	1006	406	112	292	26	1842	30
6	83	0	8	23	2	116	2
7	68	2	0	16	1	87	1
8	314	15	11	131	7	478	8
9	205	2	4	41	8	260	4
10	529	24	116	161	14	844	15
Total	3571	963	388	1050	136	6108	100
%	59	16	6	17	2	100	

TABLE XII

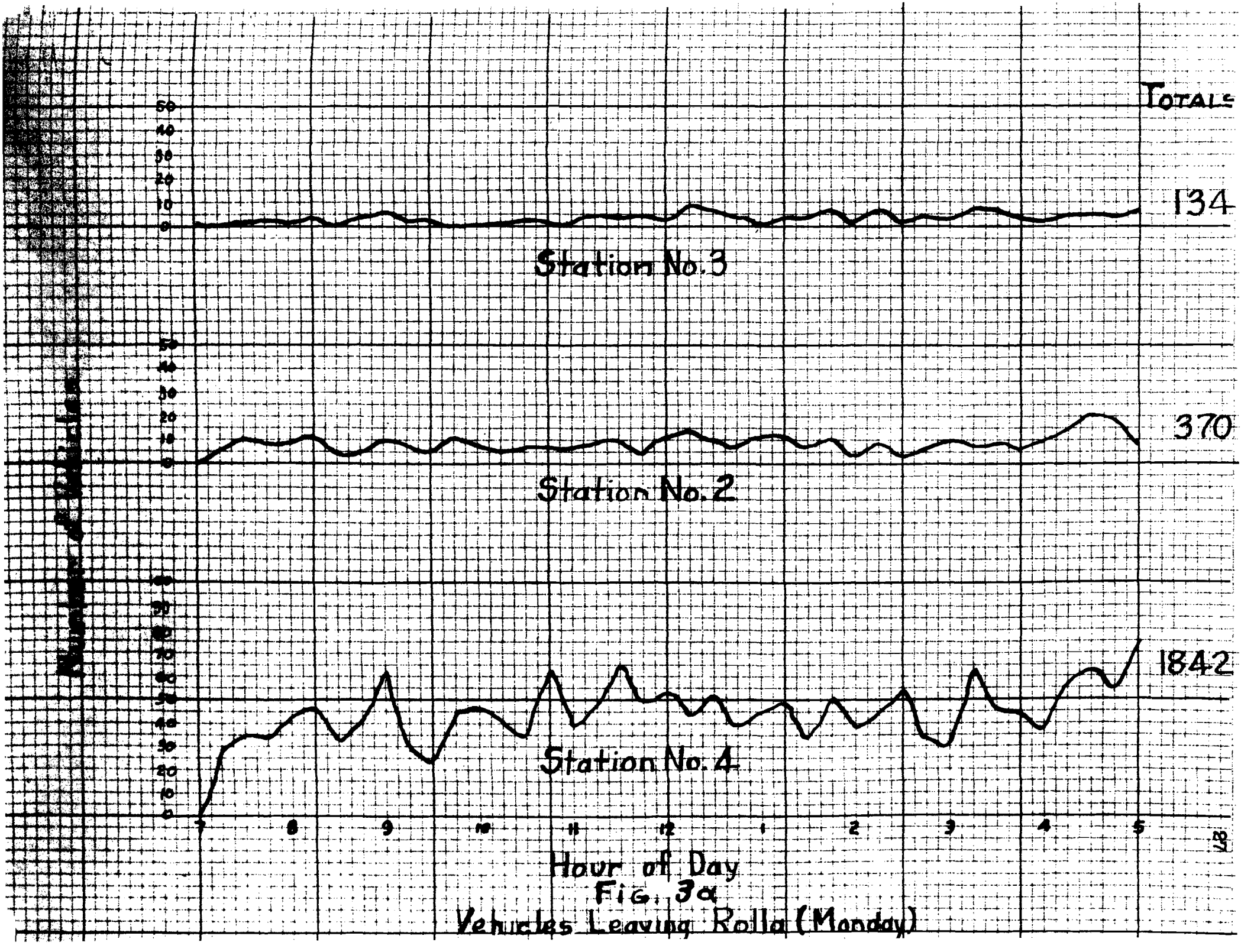


Fig. 3a
Vehicles Leaving Rolla (Monday)

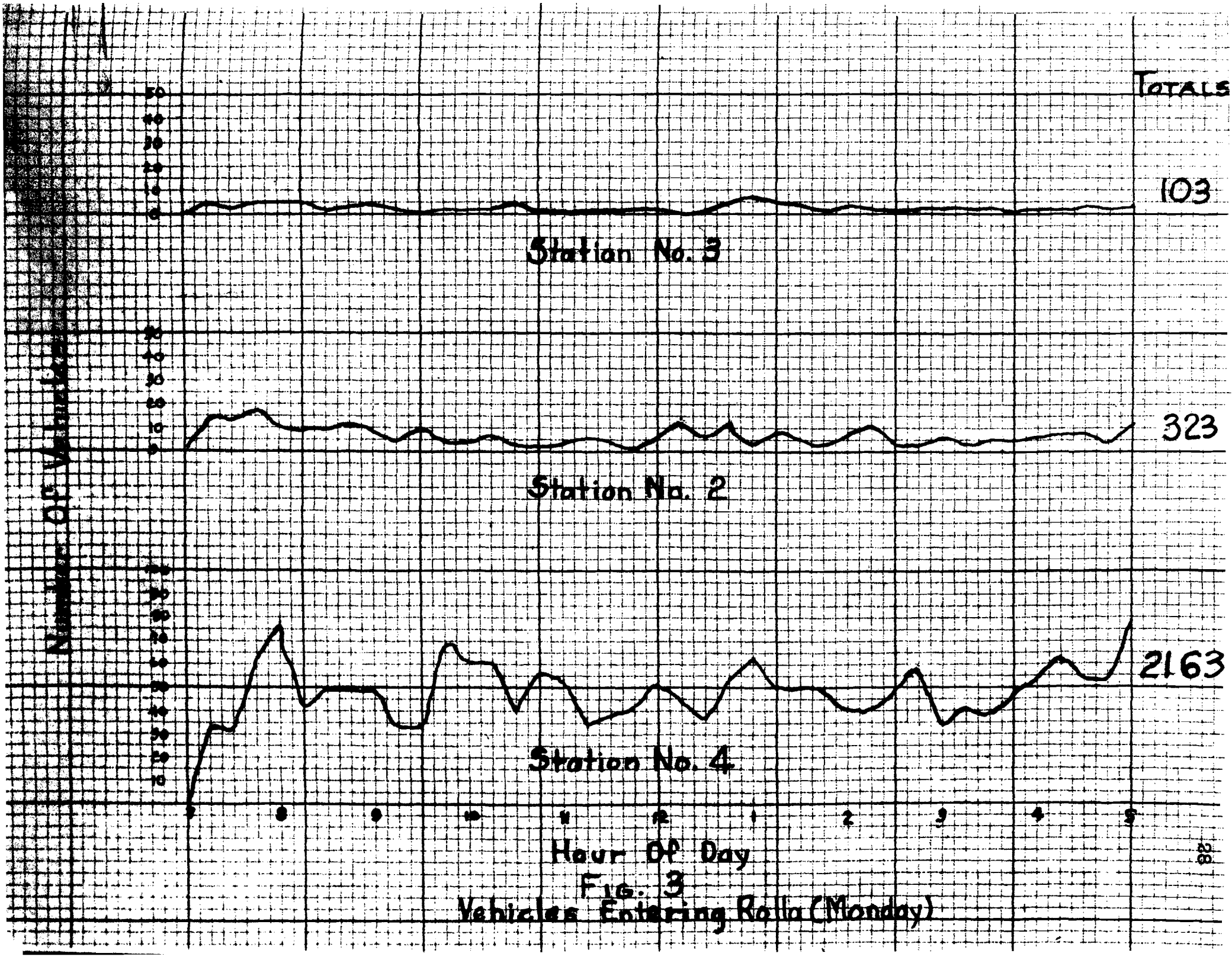


Fig. 3
Vehicles Entering Rolla (Monday)

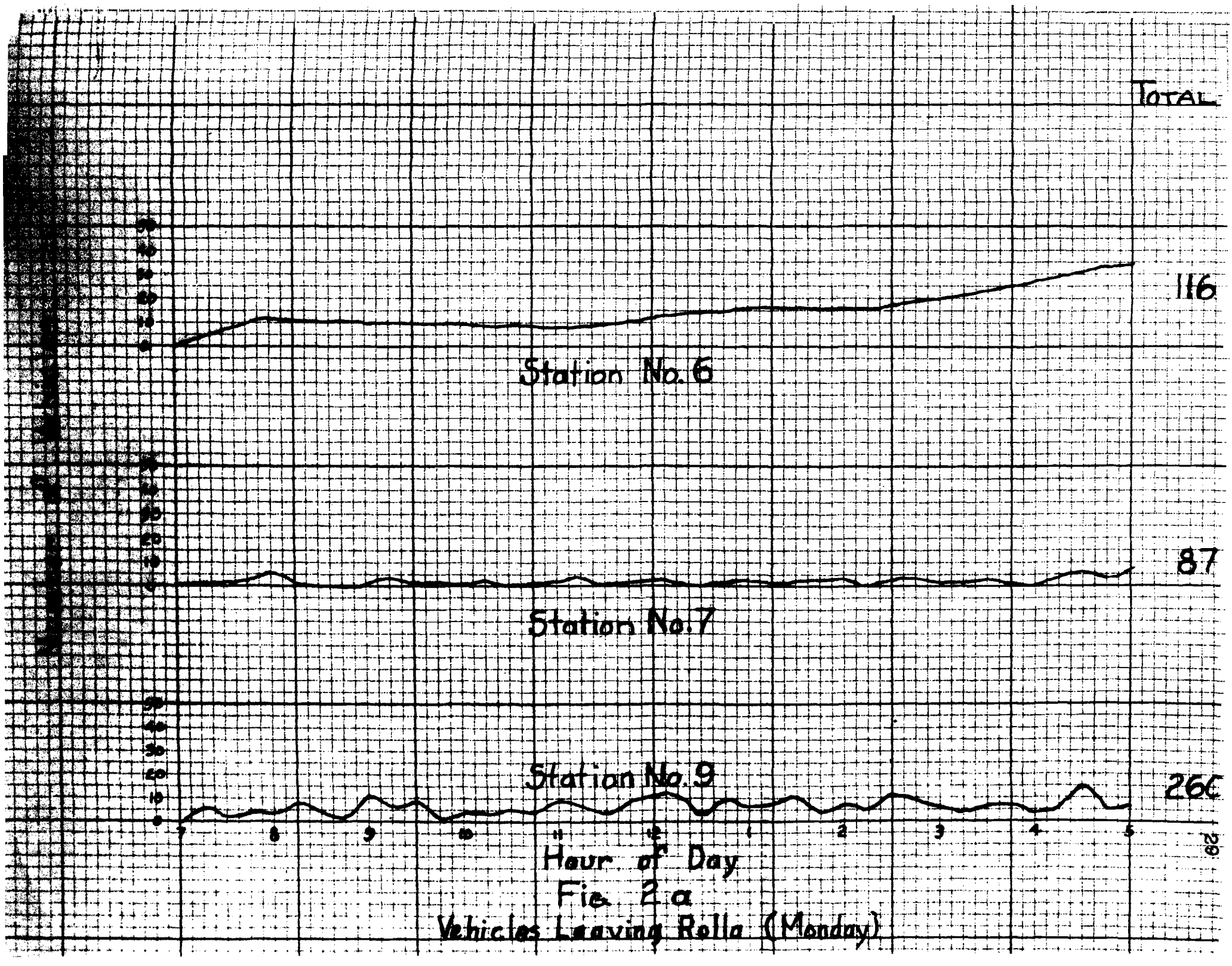


Fig. 2a

Vehicles Leaving Rolla (Monday)

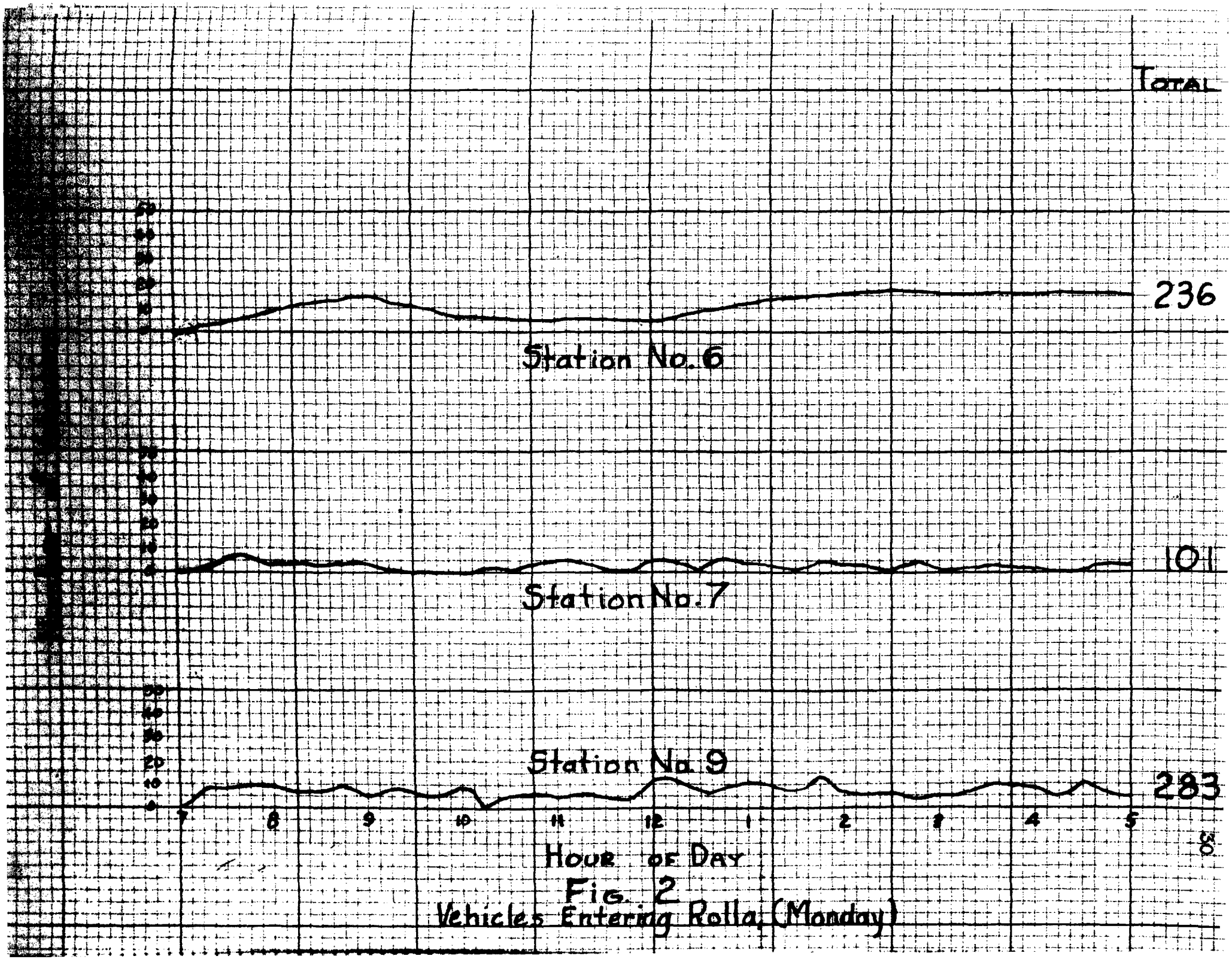


Fig. 2
Vehicles Entering Rolla (Monday)

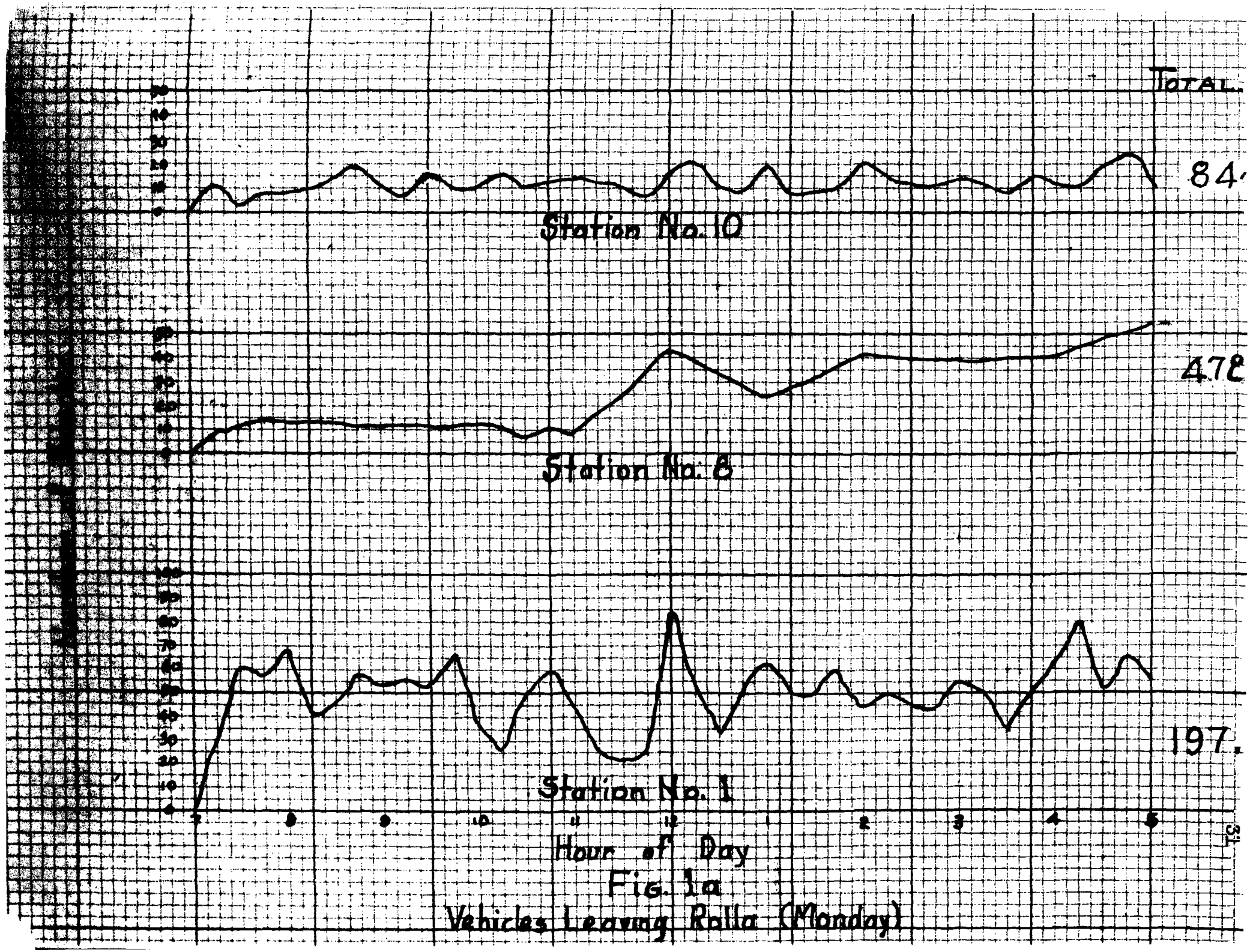


Fig. 1a
Vehicles Leaving Rolla (Monday)

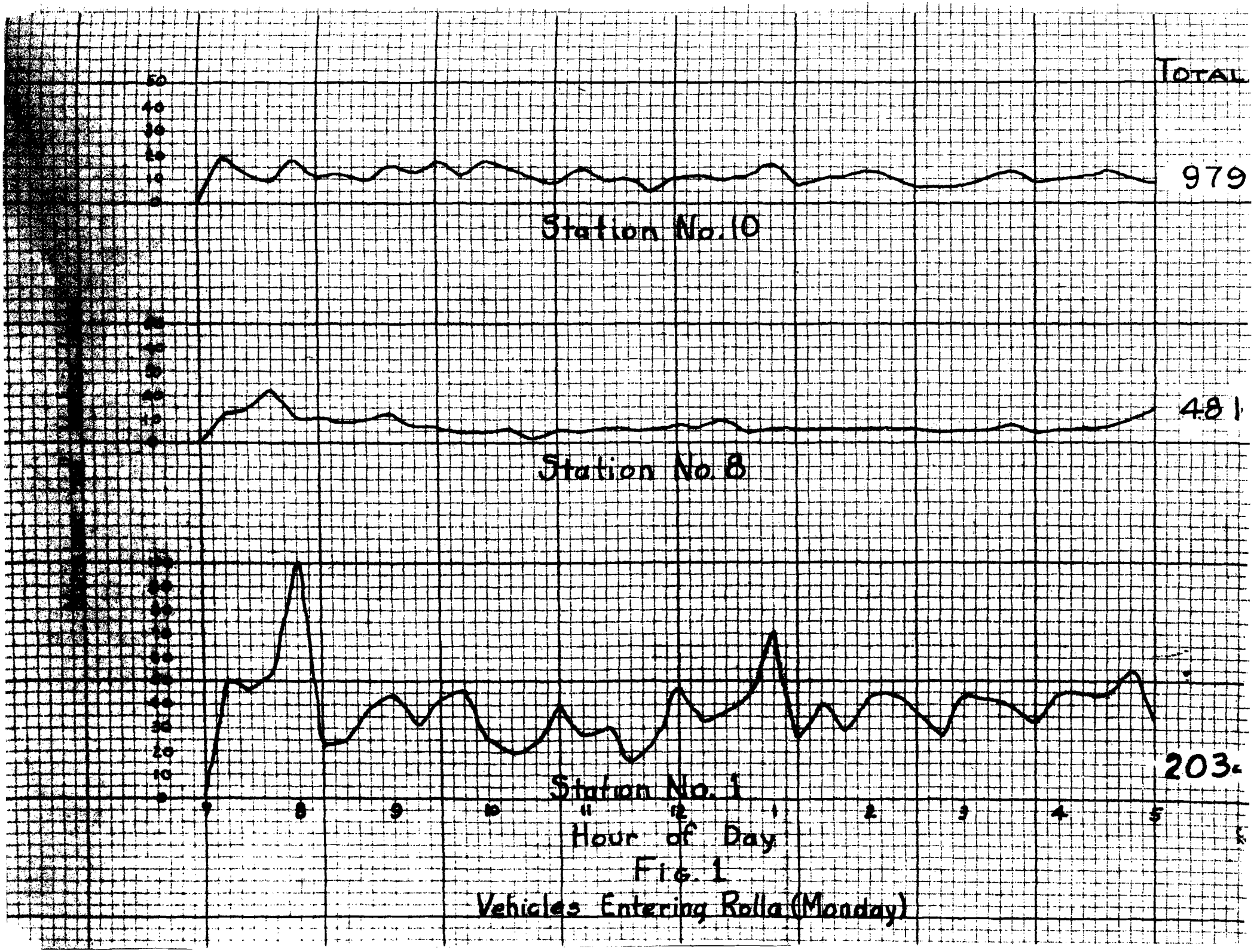


Fig. 1

Vehicles Entering Rolla (Monday)

VEHICLES ENTERING ROLLA (Tuesday)

Sta.	Local	Foreign	Heavy Trucks	Light Trucks	Others	Total Vehicles	%
1	1425	390	111	447	37	2410	32
2	309	25	16	91	7	448	6
3	90	5	7	28	6	136	2
4	1141	493	183	314	30	2161	28
6	73	1	3	26	2	105	1
7	415	8	29	122	37	611	8
8	360	6	19	128	25	538	7
9	200	7	13	22	9	251	3
10	598	40	85	218	18	959	13
Total	4611	975	466	1396	171	7619	100
%	61	13	6	18	2	100	

VEHICLES LEAVING ROLLA (Tuesday)

1	1383	511	139	510	40	2583	37
2	286	27	22	81	9	425	6
3	96	4	3	20	2	125	2
4	891	356	107	167	27	1548	23
6	52	1	0	14	5	72	1
7	395	10	17	90	24	536	8
8	348	6	19	112	4	489	7
9	178	6	9	30	3	226	3
10	583	59	85	186	11	904	13
Total	4312	960	401	1210	125	6908	100
%	61	14	6	17	2	100	

TABLE IV

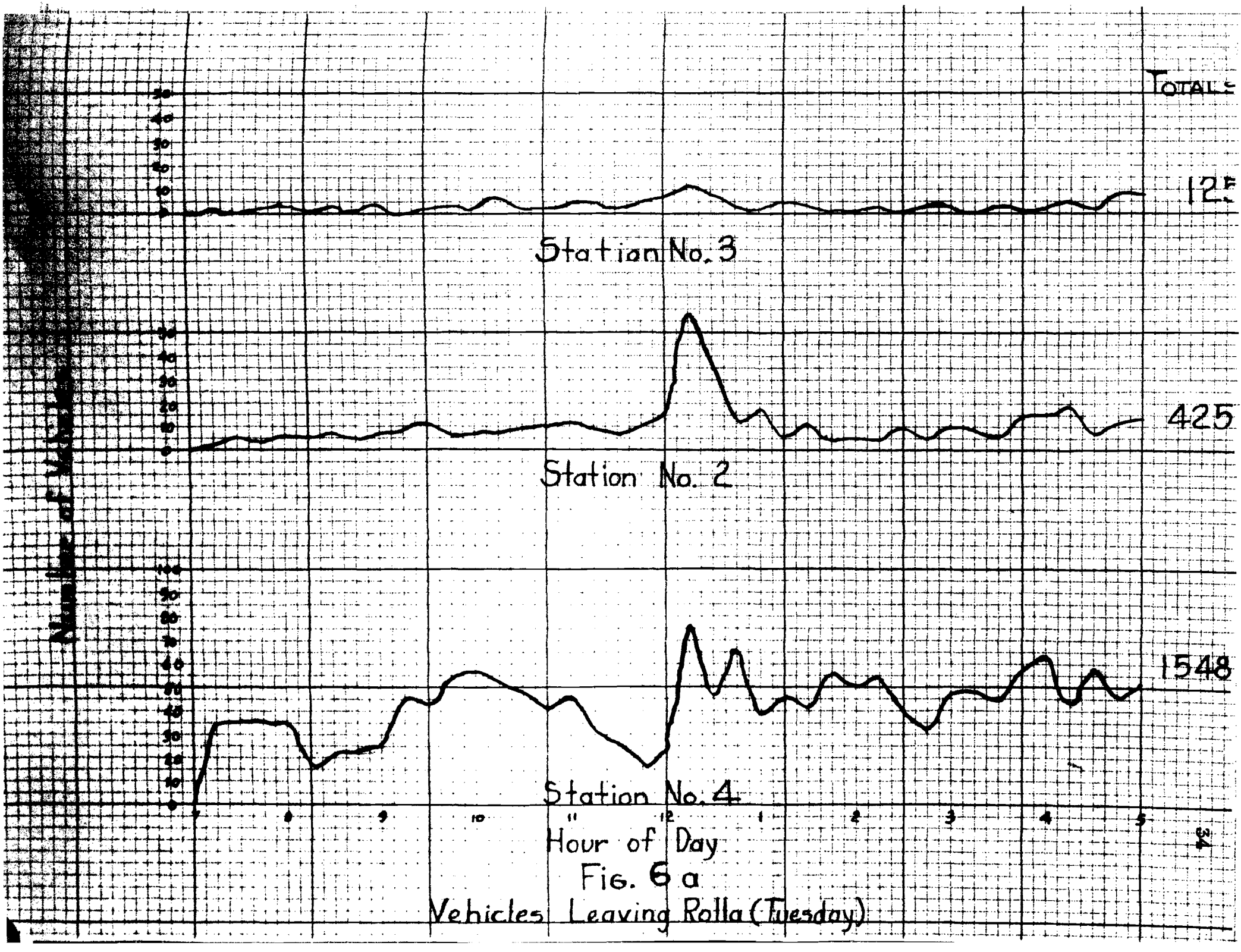


Fig. 6a

Vehicles Leaving Rolla (Tuesday)

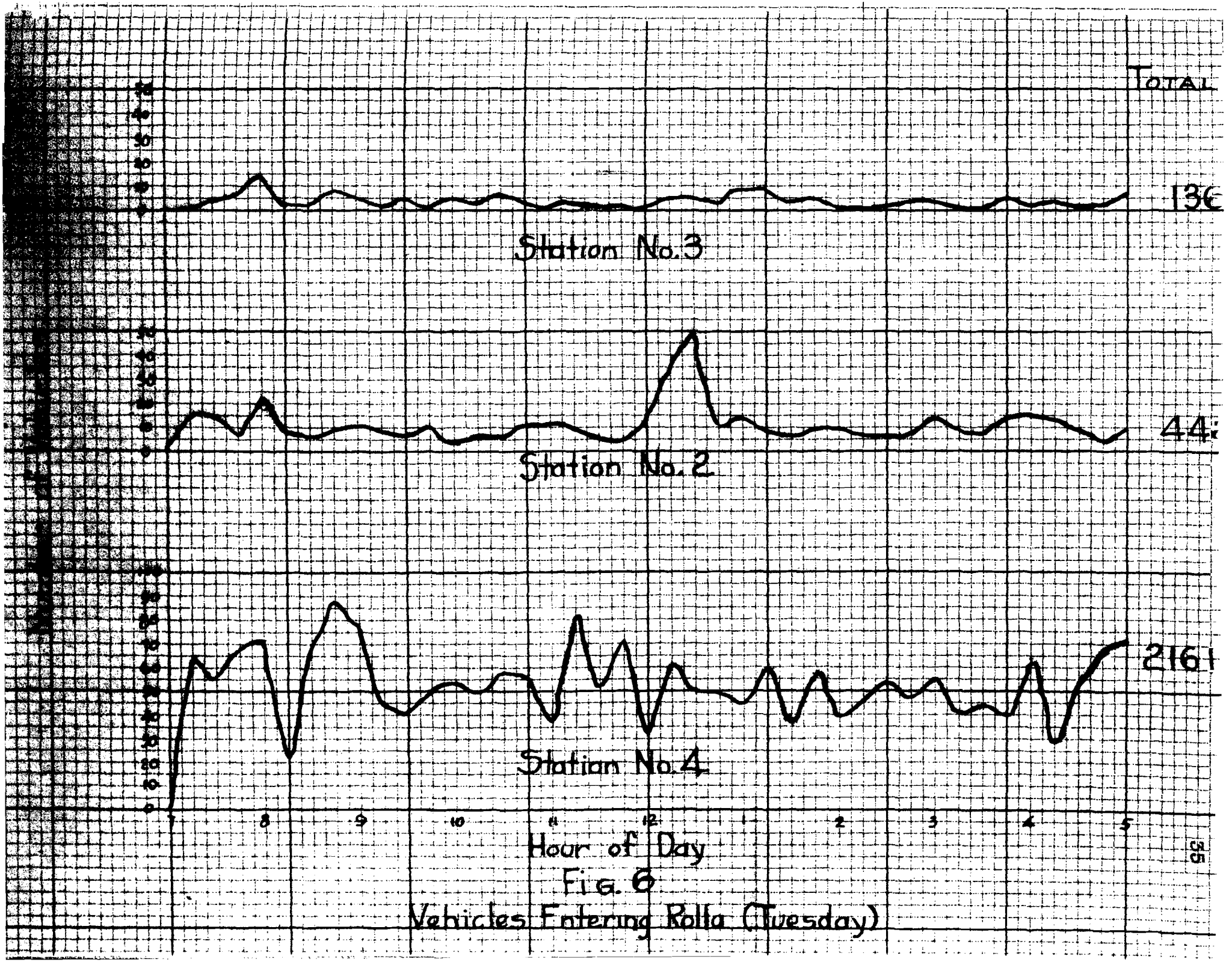


Fig. 6

Vehicles Entering Rolla (Tuesday)

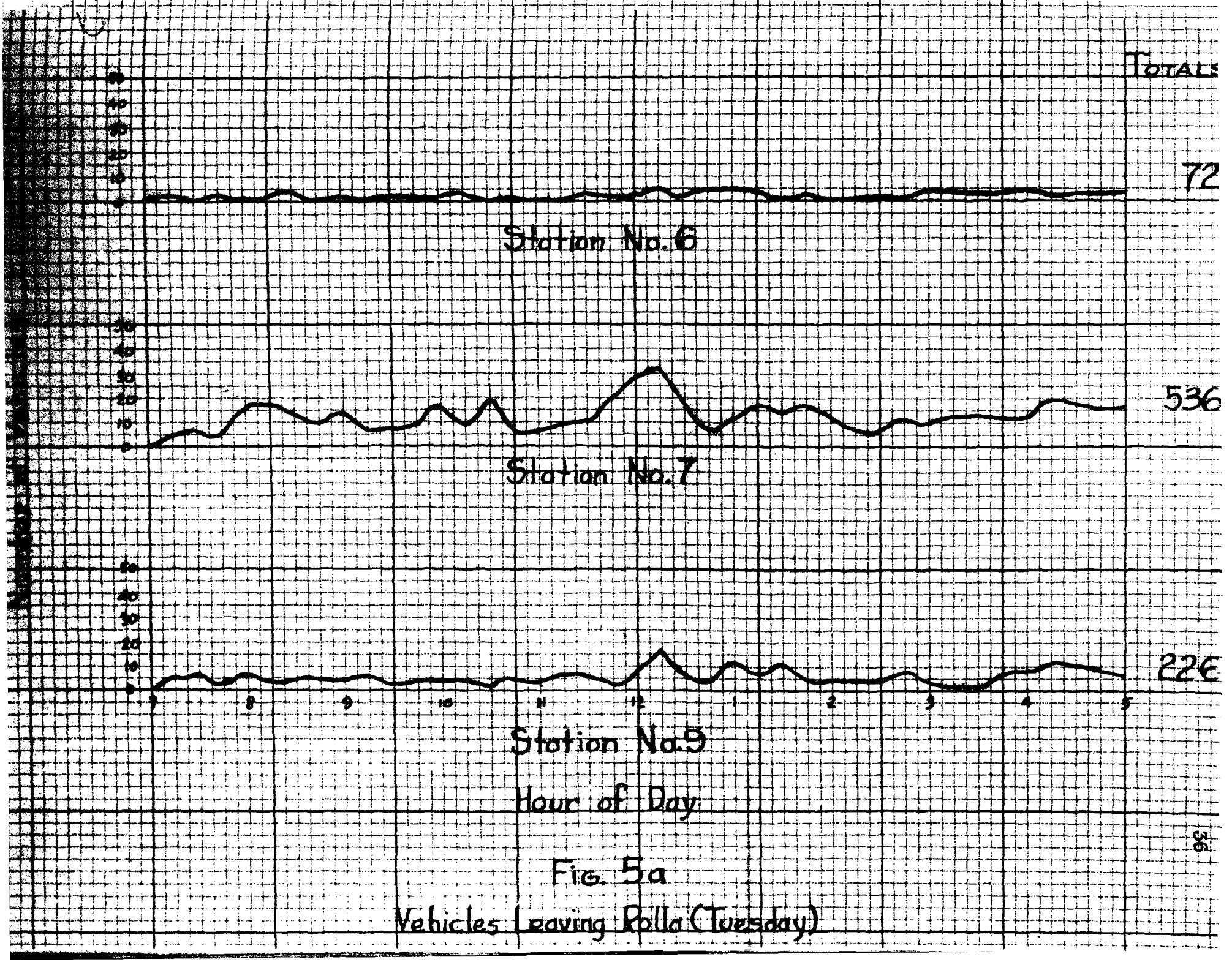


Fig. 5a

Vehicles Leaving Rolla (Tuesday)

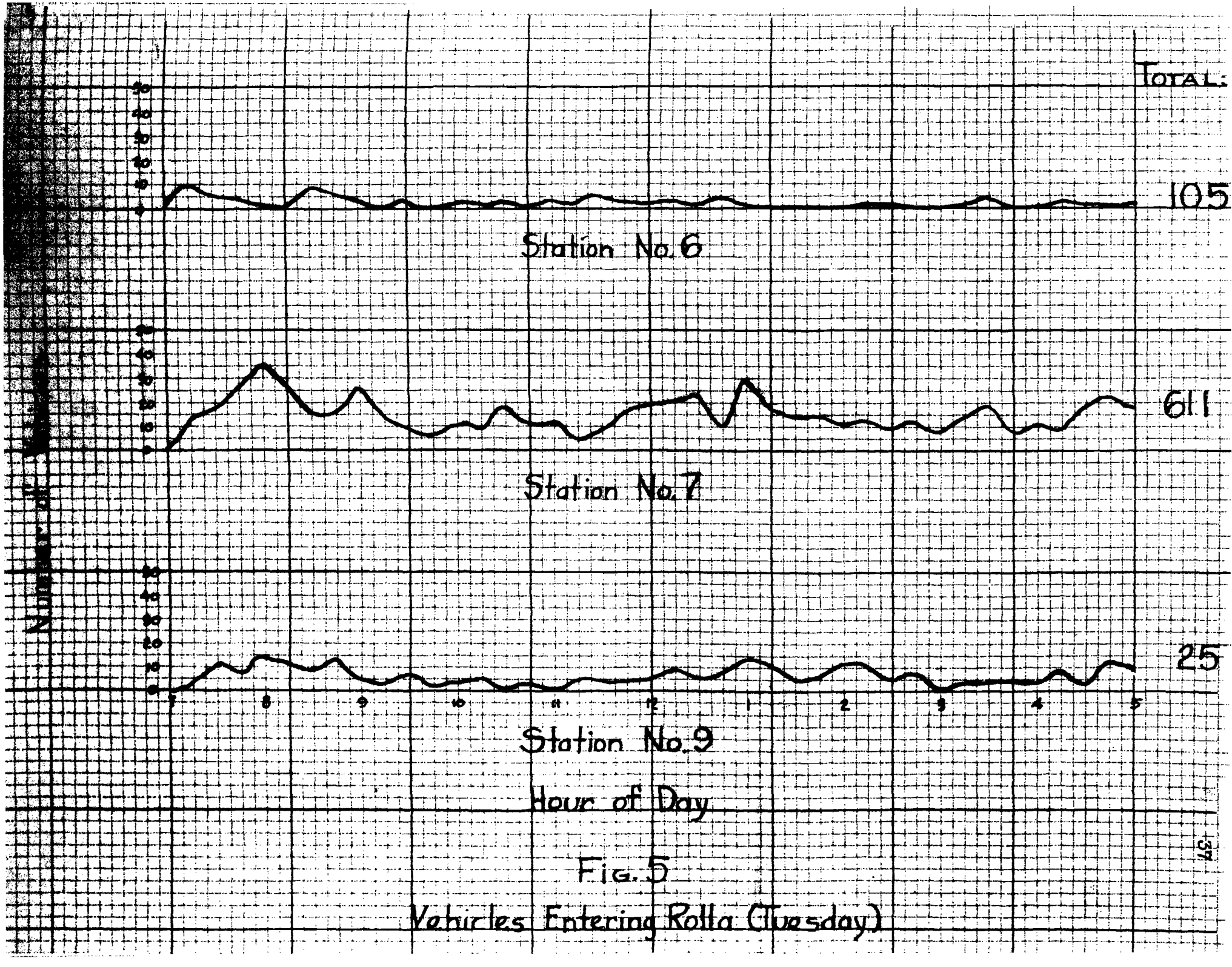


Fig. 5

Vehicles Entering Rolla (Tuesday)

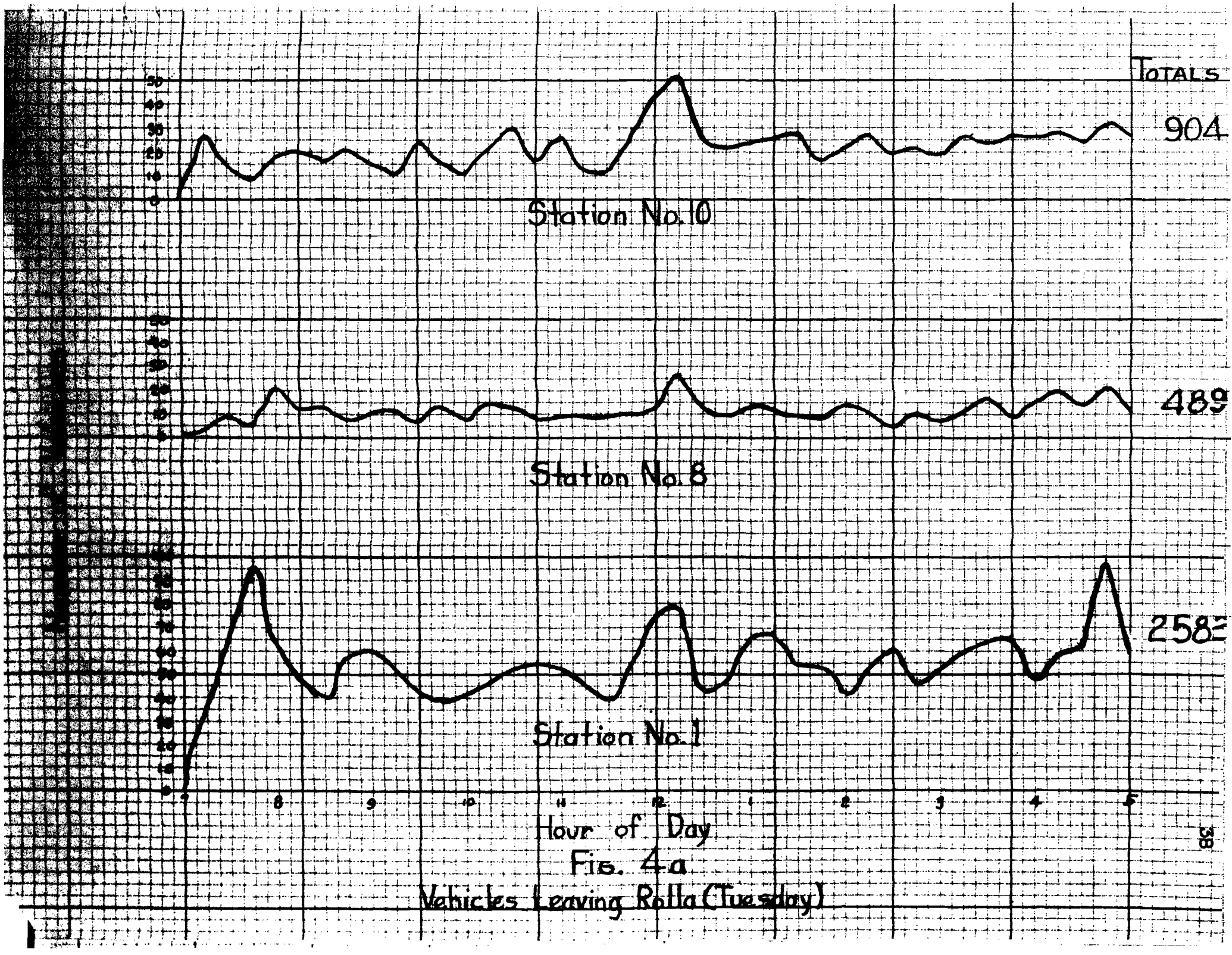


Fig. 4a

Vehicles Leaving Rolla (Tuesday)

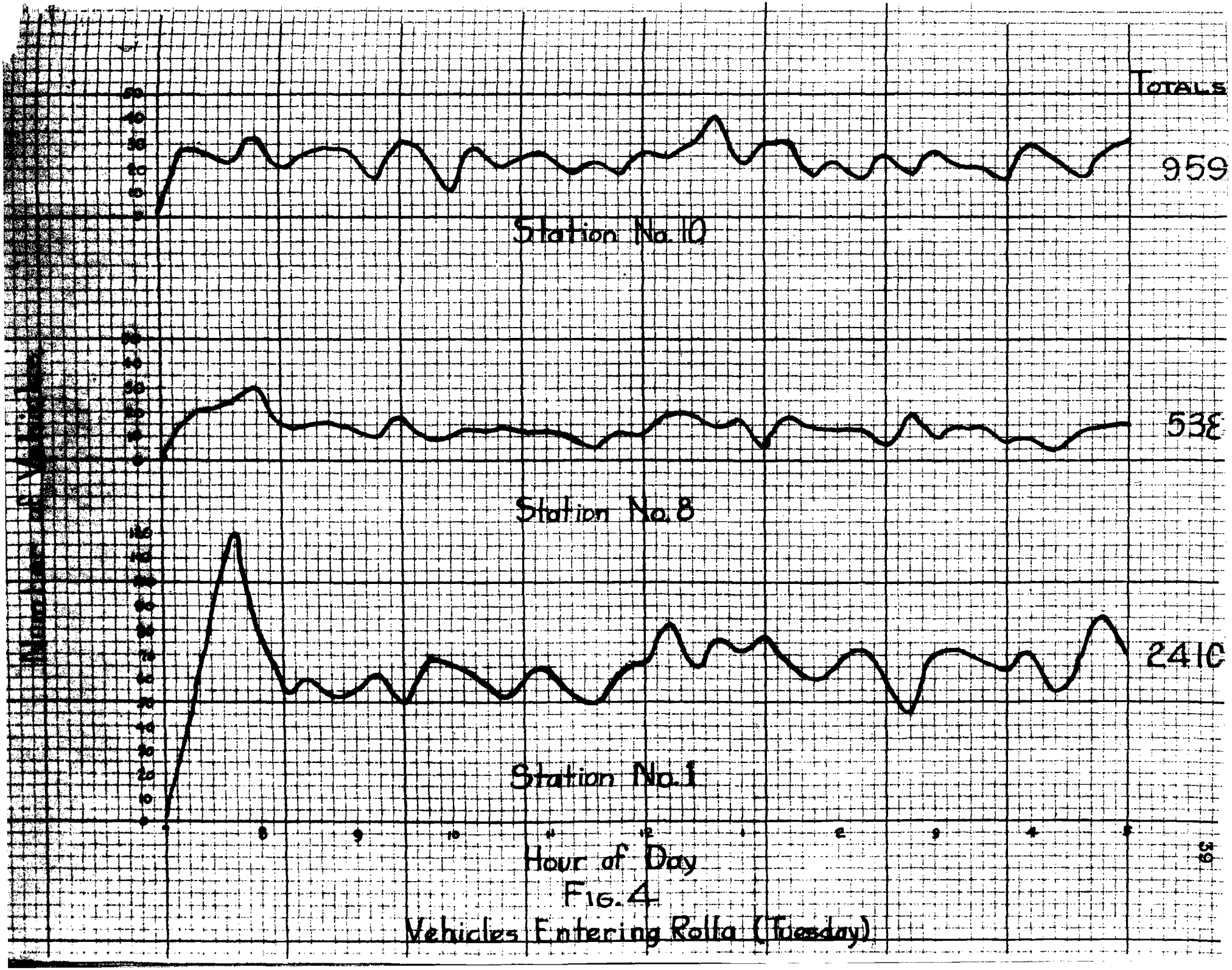


FIG. 4

Vehicles Entering Rolla (Tuesday)

VEHICLES ENTERING ROLLA (Wednesday)

Sta.	Local	Foreign	Heavy Trucks	Light Trucks	Others	Total Vehicles	%
1	1465	452	215	486	34	2652	33
2	246	16	6	78	6	352	4
3	86	6	6	25	9	132	2
4	1053	488	115	392	51	2099	26
6	98	0	2	18	2	120	1
7	383	8	25	106	43	565	7
8	360	12	15	144	30	561	7
9	282	11	11	89	6	399	5
10	745	85	75	317	17	1172	15
Total	4718	1018	470	1655	198	8059	100
%	59	13	6	20	2	100	

VEHICLES LEAVING ROLLA (Wednesday)

1	1409	532	257	521	60	2779	36
2	251	21	5	81	6	364	5
3	85	7	3	33	15	145	2
4	784	417	96	371	30	1698	22
6	72	2	1	13	4	92	1
7	348	6	20	77	15	466	6
8	325	14	12	143	10	504	7
9	270	9	6	78	7	370	5
10	752	27	21	358	18	1246	16
Total	4296	1035	491	1675	165	7662	100
%	56	14	6	22	2	100	

TABLE V

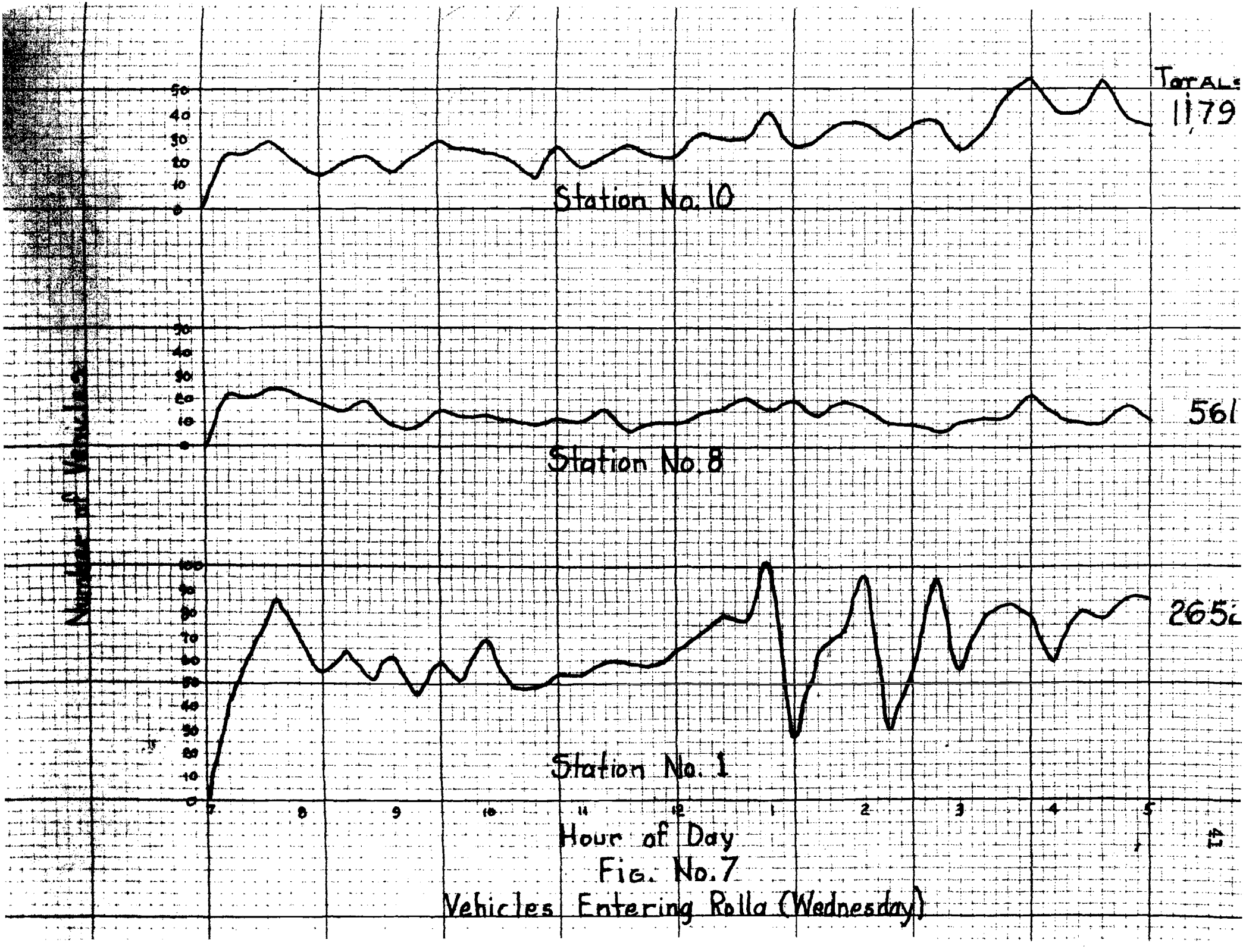


Fig. No. 7

Vehicles Entering Rolla (Wednesday)

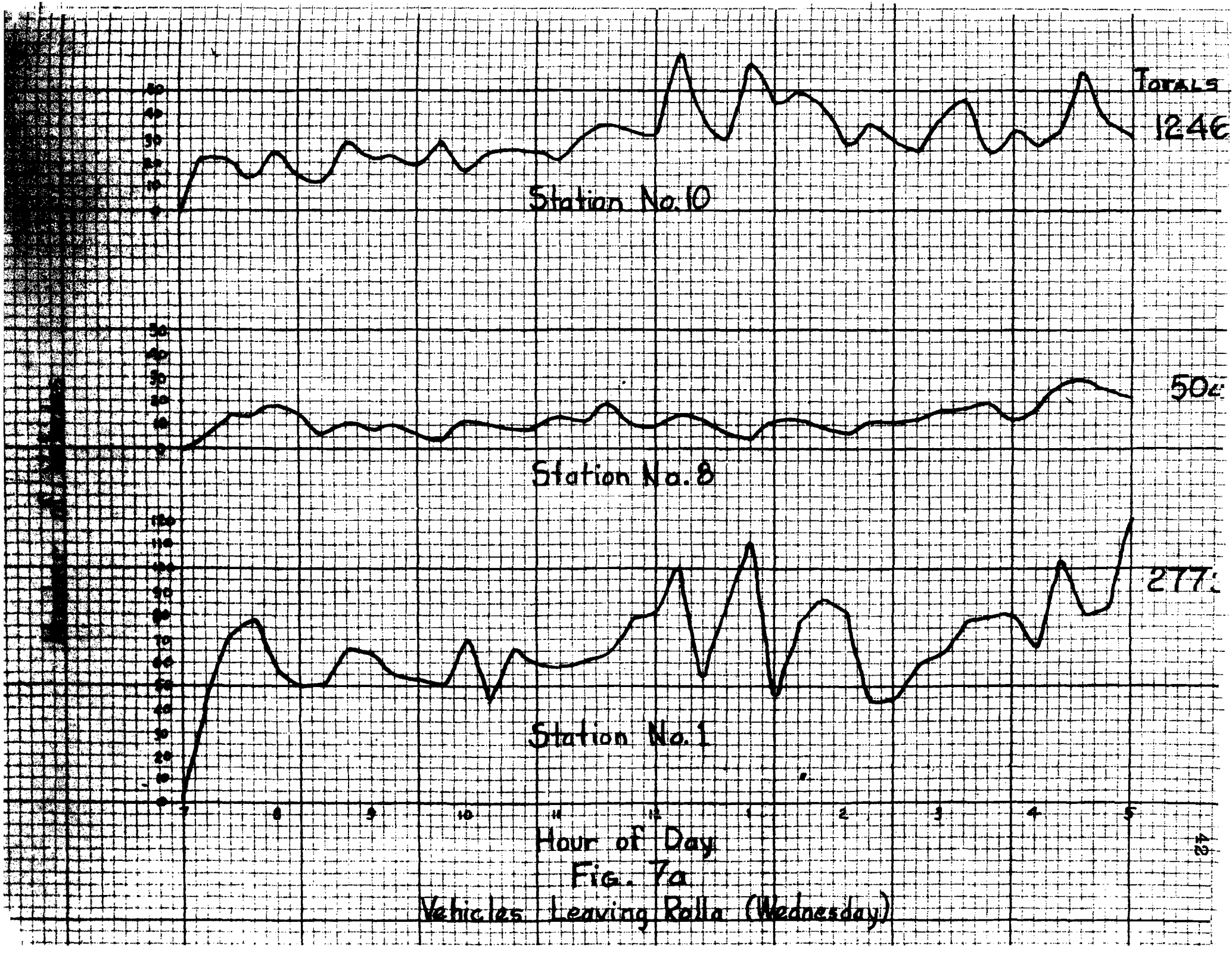


Fig. 7a

Vehicles Leaving Rolla (Wednesday)

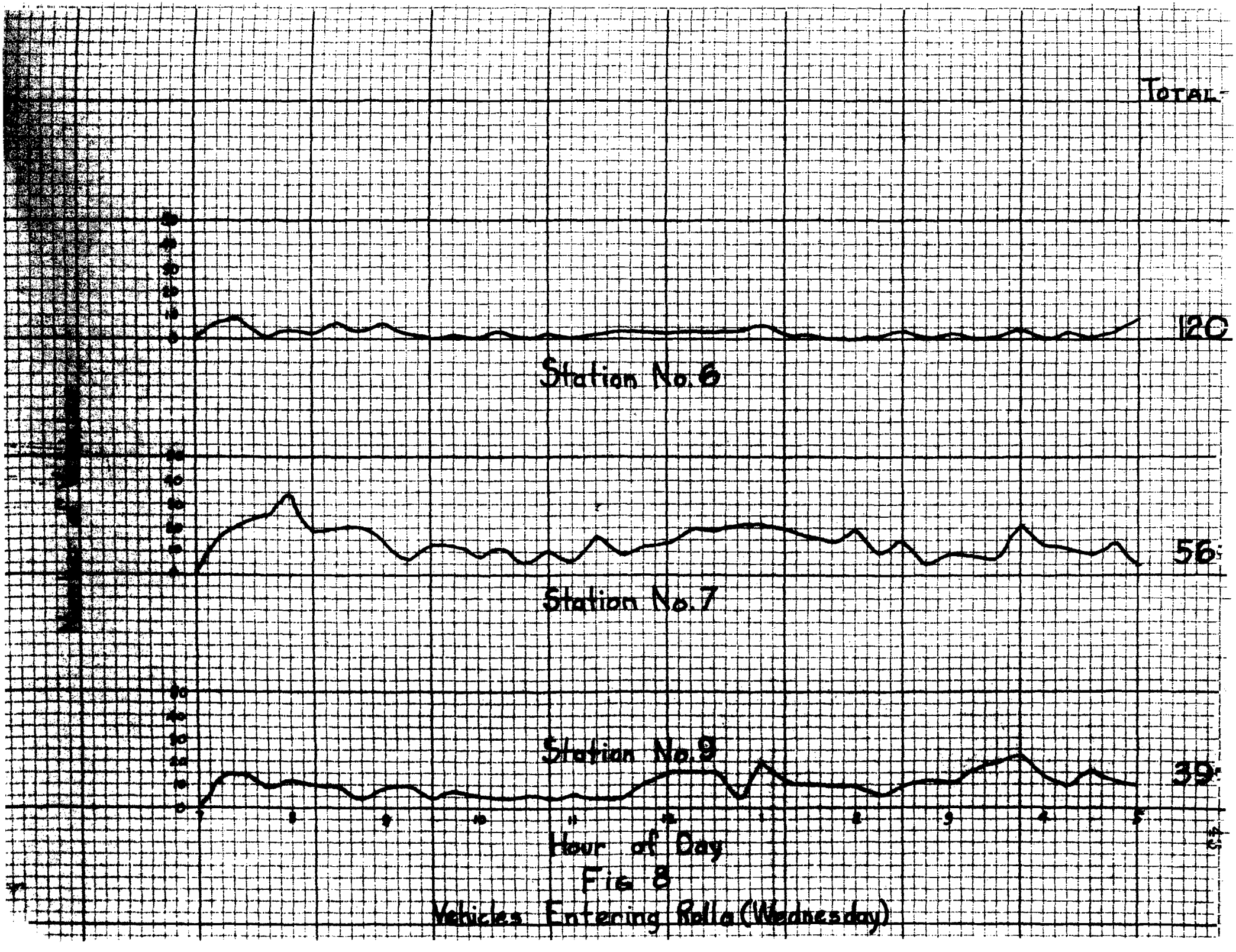


Fig 8

Vehicles Entering Rolla (Wednesday)

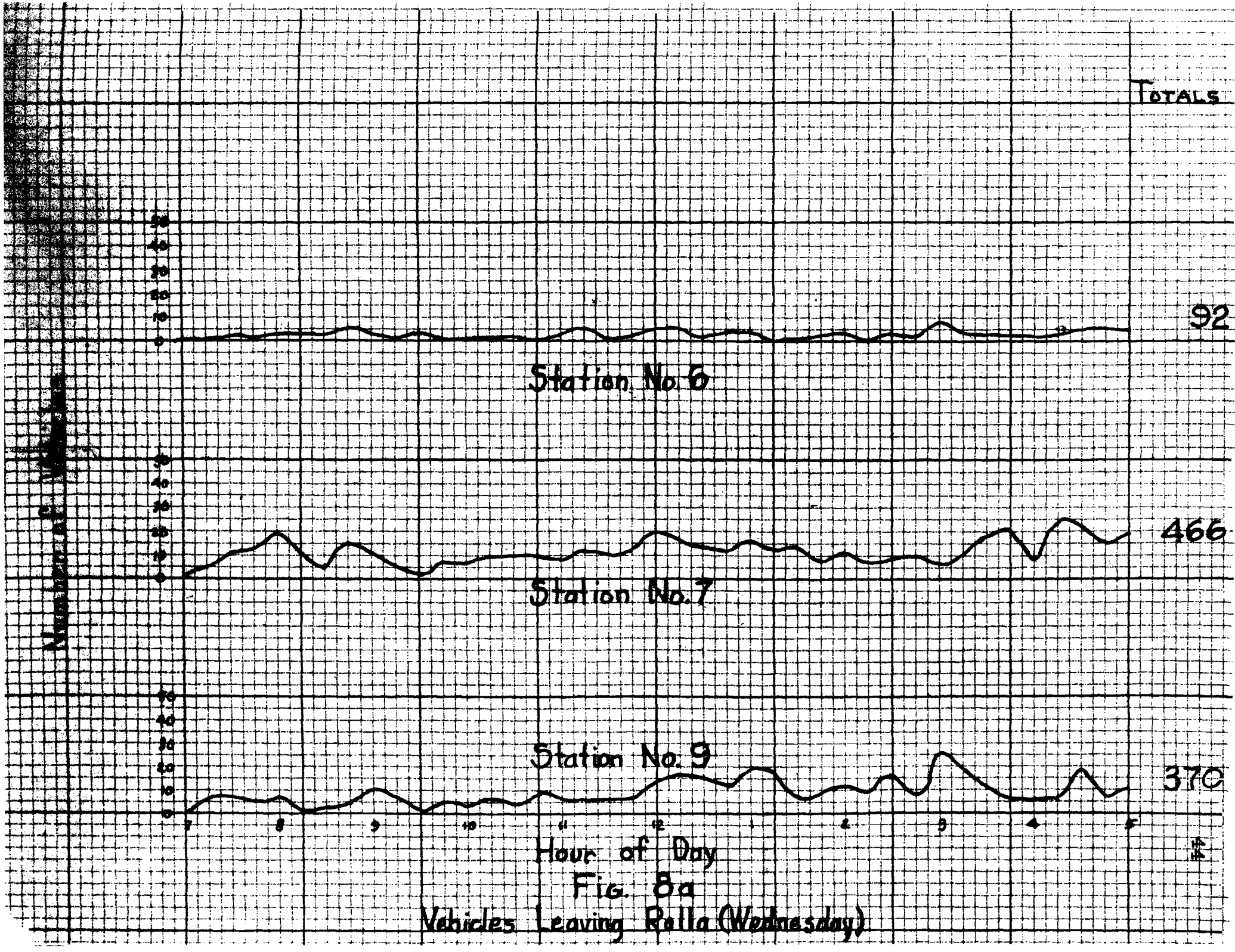


Fig. 8a

Vehicles Leaving Rolla (Wednesday)

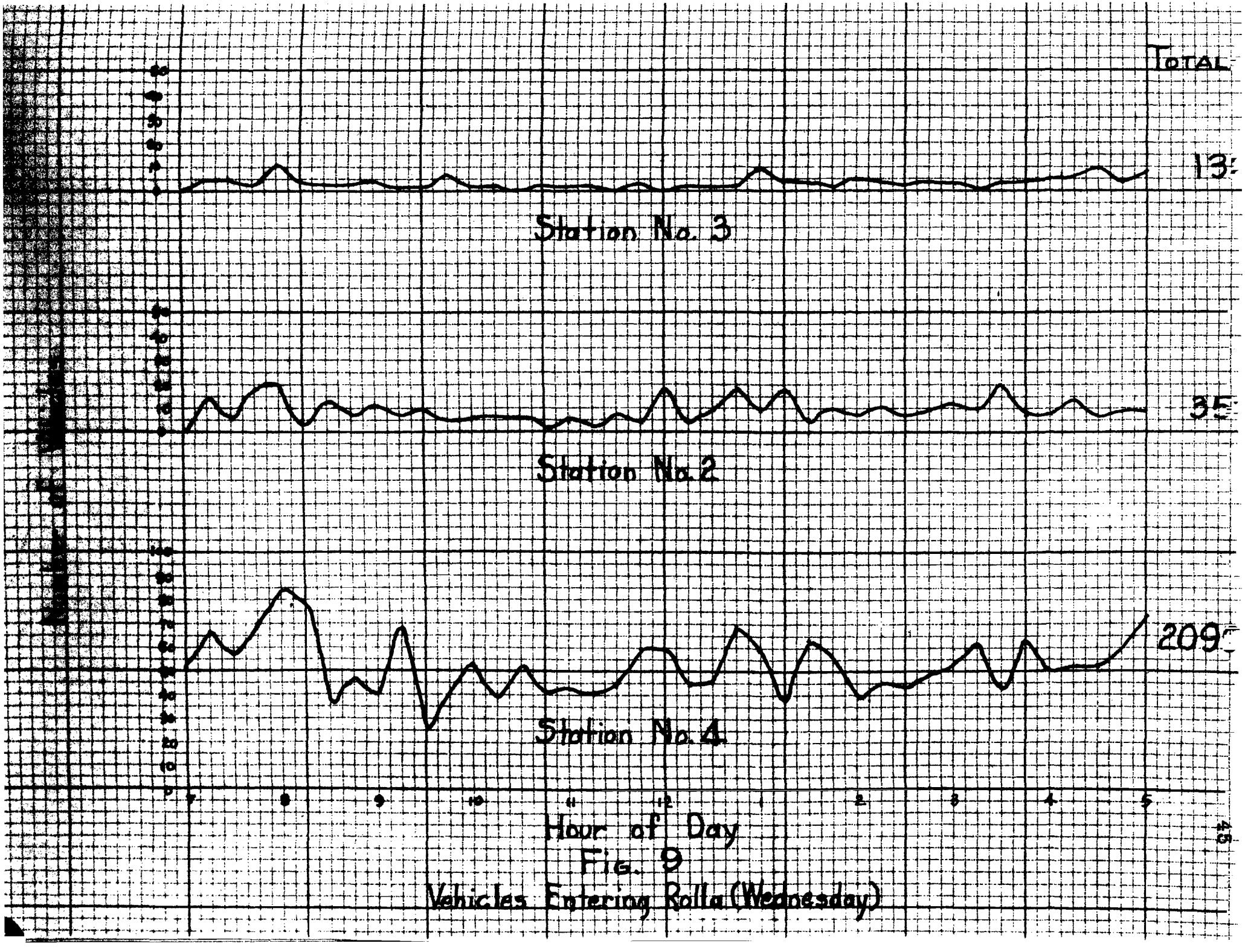


Fig. 9

Vehicles Entering Rolla (Wednesday)

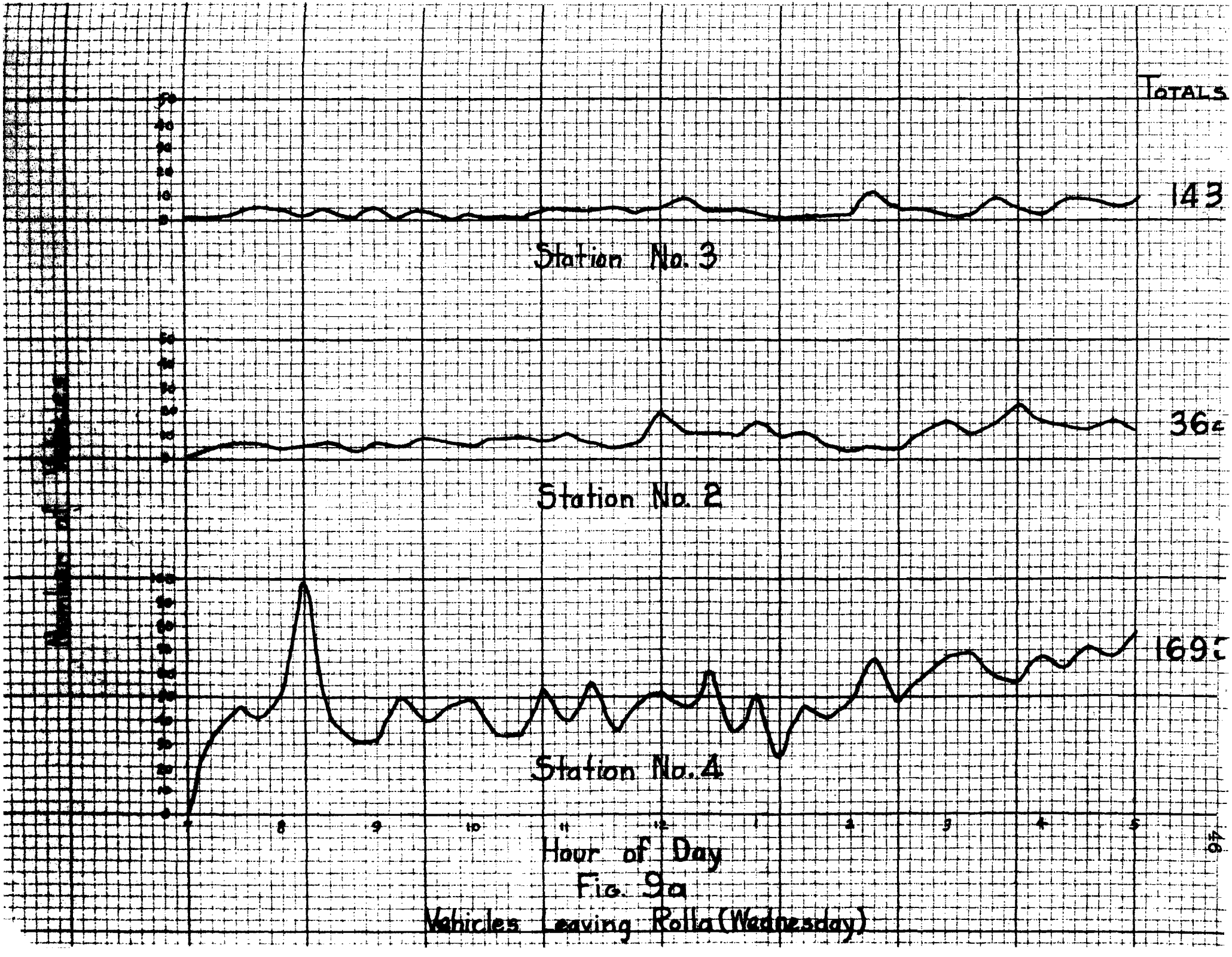


Fig. 9a

Vehicles leaving Rolla (Wednesday)

VEHICLES ENTERING ROLLA (Thursday)

Sta.	Local	Foreign	Heavy Trucks	Light Trucks	Others	Total Vehicles	%
1	1361	414	152	405	25	2355	32
2	229	8	2	102	4	345	5
3	97	11	2	31	1	142	2
4	1022	523	192	317	34	2088	29
6	97	4	1	28	2	132	2
7	370	12	11	95	26	514	7
8	336	11	6	121	26	500	7
9	246	9	19	37	10	321	4
10	574	33	34	269	11	921	12
Total	4332	1025	419	1394	139	7309	100
%	59	14	6	19	2	100	

VEHICLES LEAVING ROLLA (Thursday)

1	1351	386	195	414	18	2364	35
2	180	13	2	88	3	286	4
3	73	8	2	30	0	113	2
4	855	519	173	274	23	1844	27
6	76	4	0	21	4	105	2
7	328	3	13	89	5	438	6
8	314	15	7	124	7	467	7
9	177	5	17	42	8	249	3
10	677	38	47	272	15	969	14
Total	3961	986	456	1360	85	6836	100
%	58	15	6	20	1	100	

TABLE VI

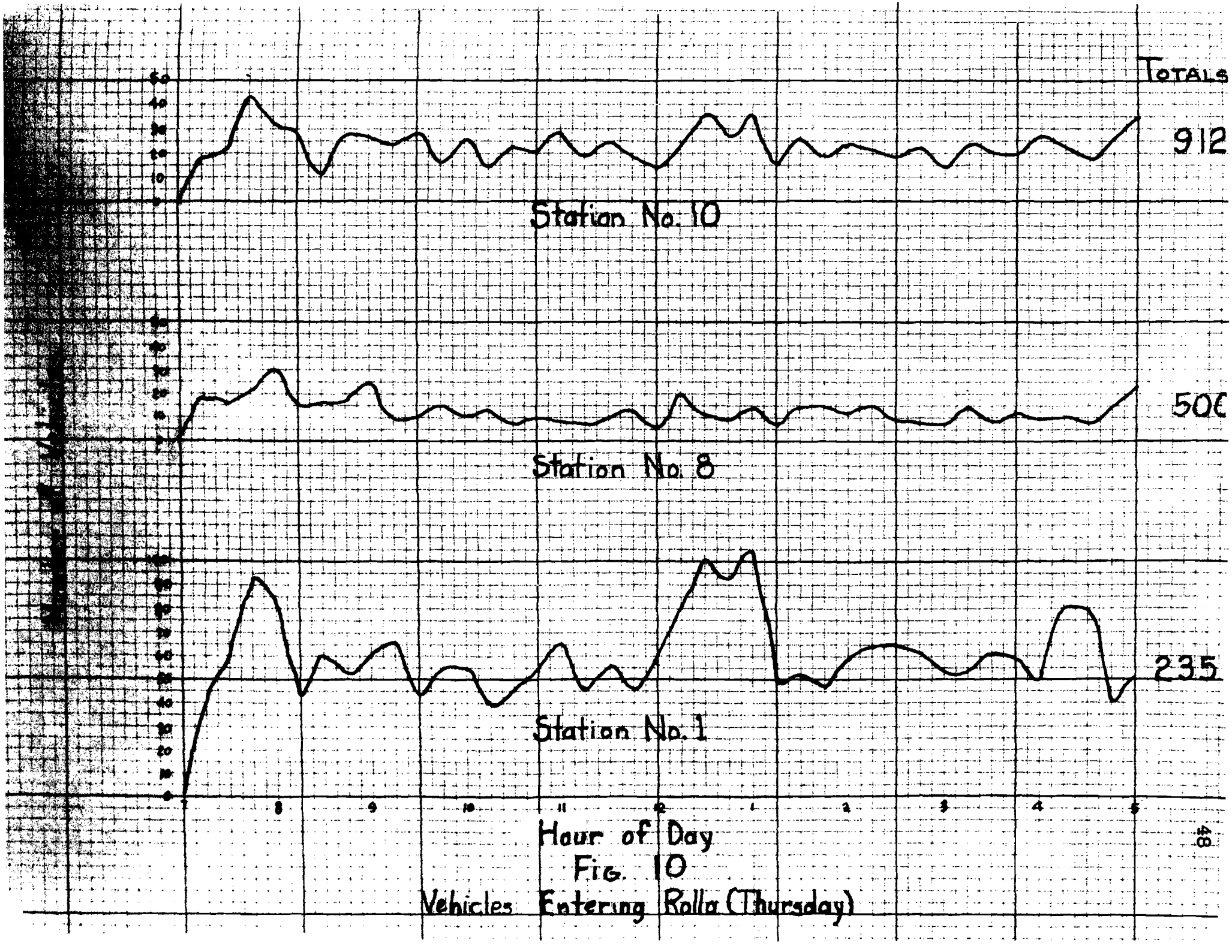


Fig. 10

Vehicles Entering Rolla (Thursday)

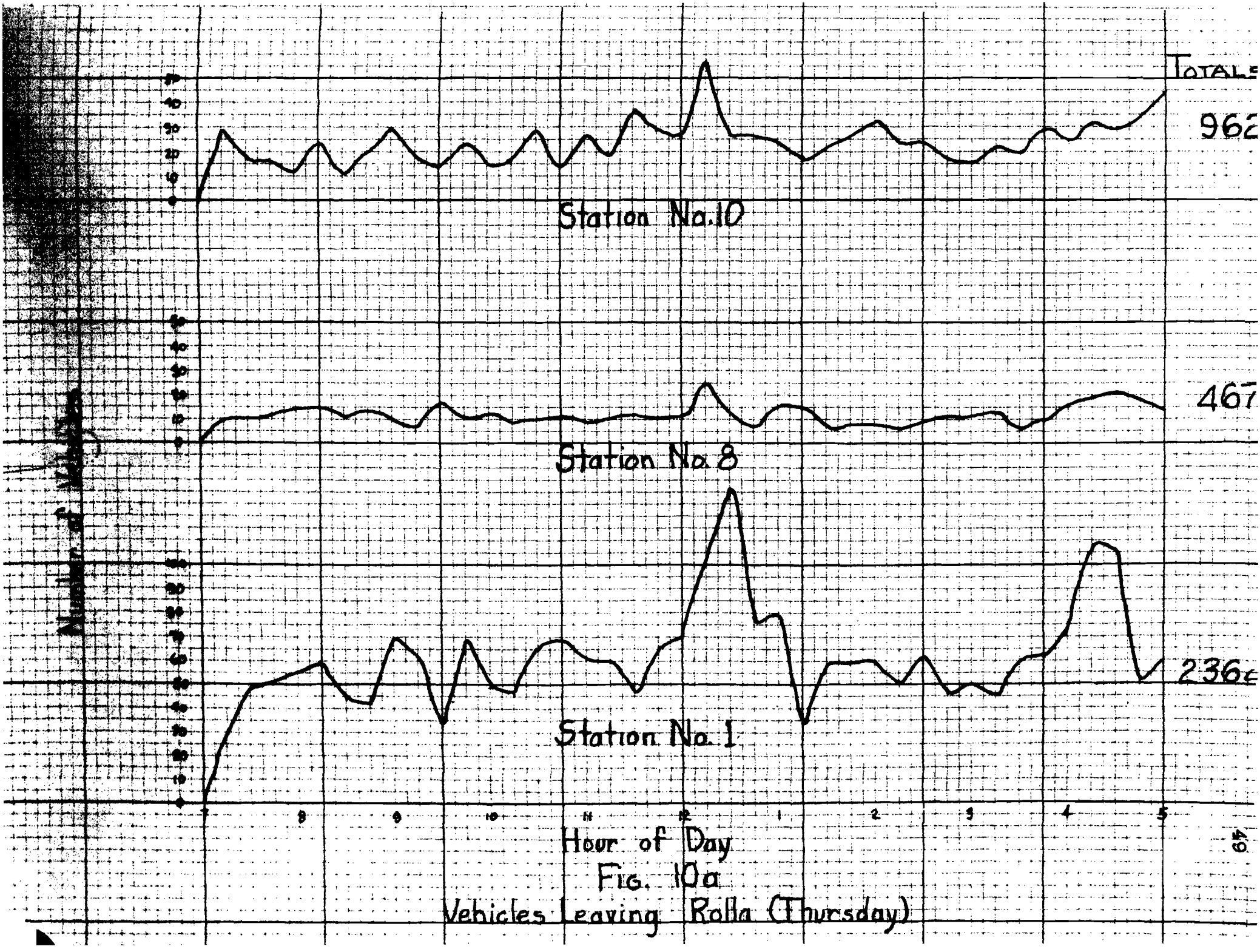


Fig. 10a

Vehicles Leaving Rolla (Thursday)

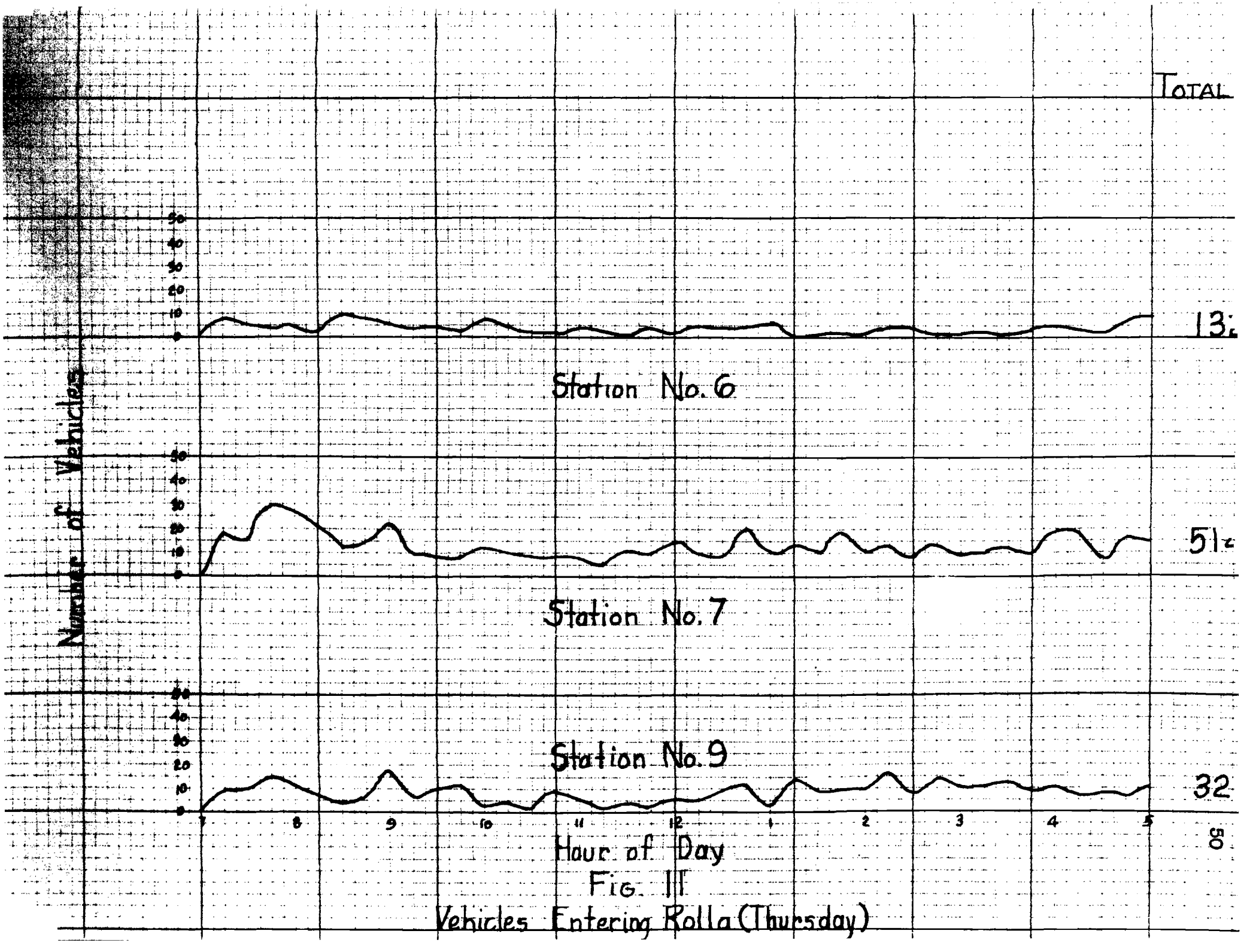


Fig. II

Vehicles Entering Rolla (Thursday)

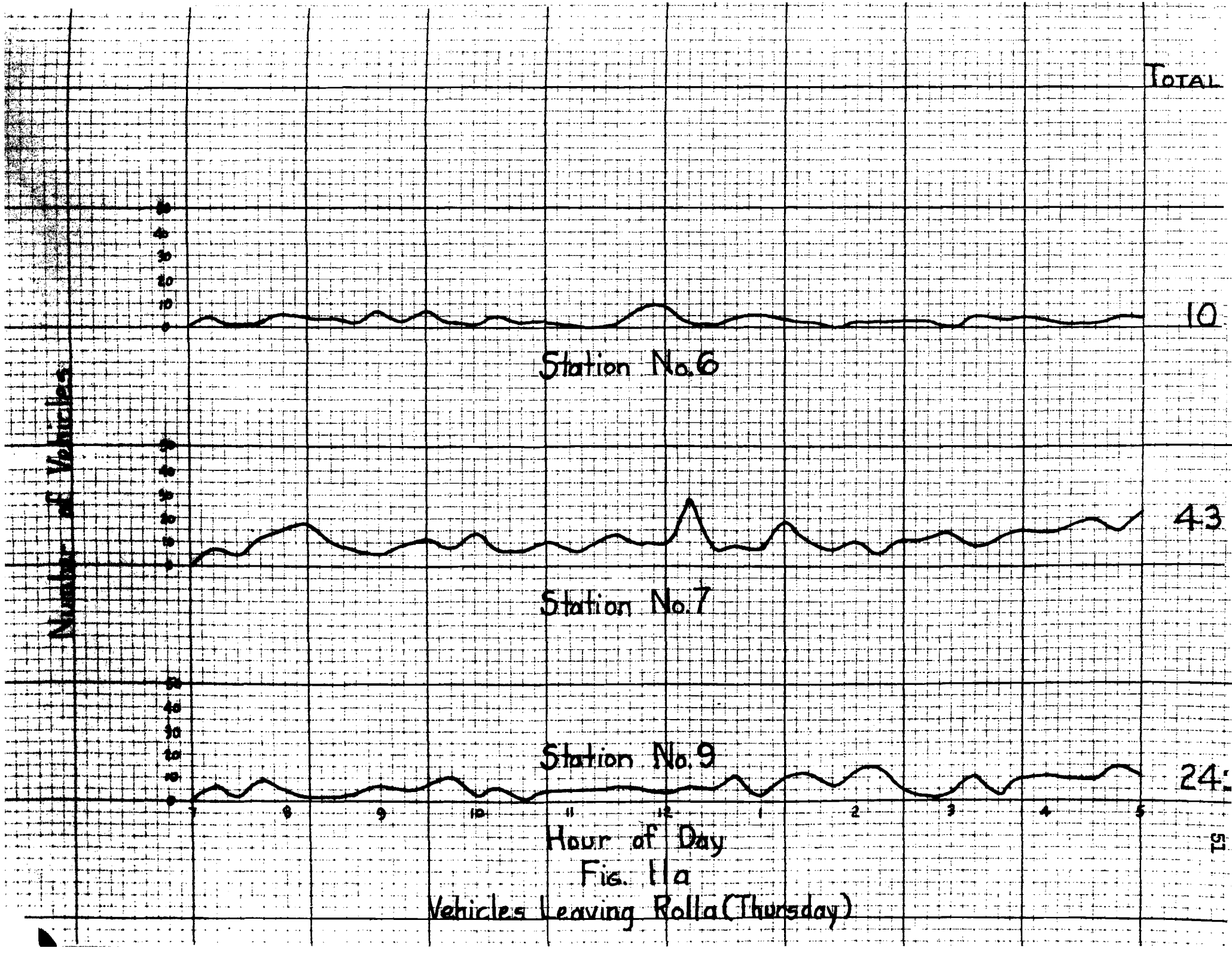


Fig. 11a

Vehicles Leaving Rolla (Thursday)

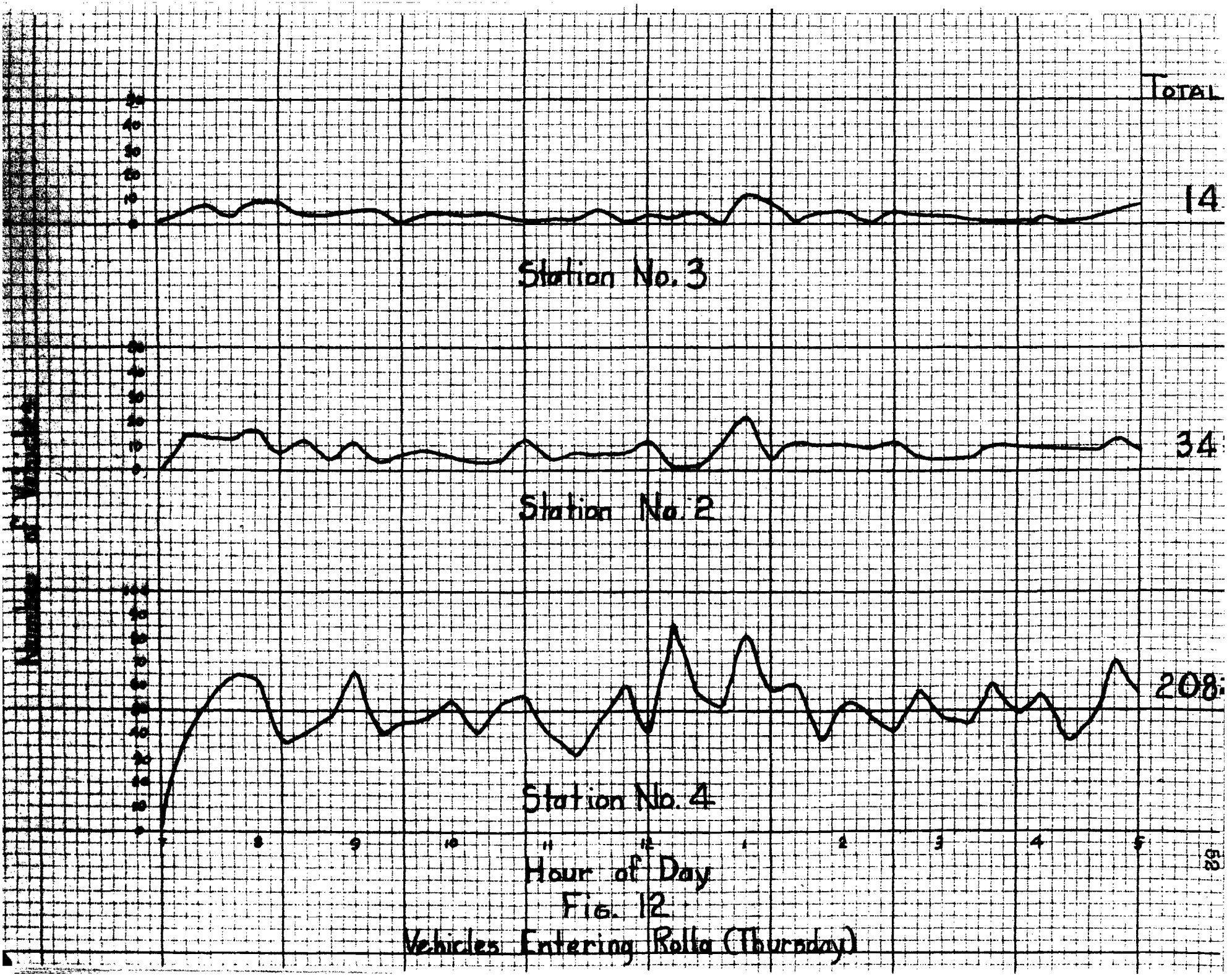


Fig. 12

Vehicles Entering Rolla (Thursday)

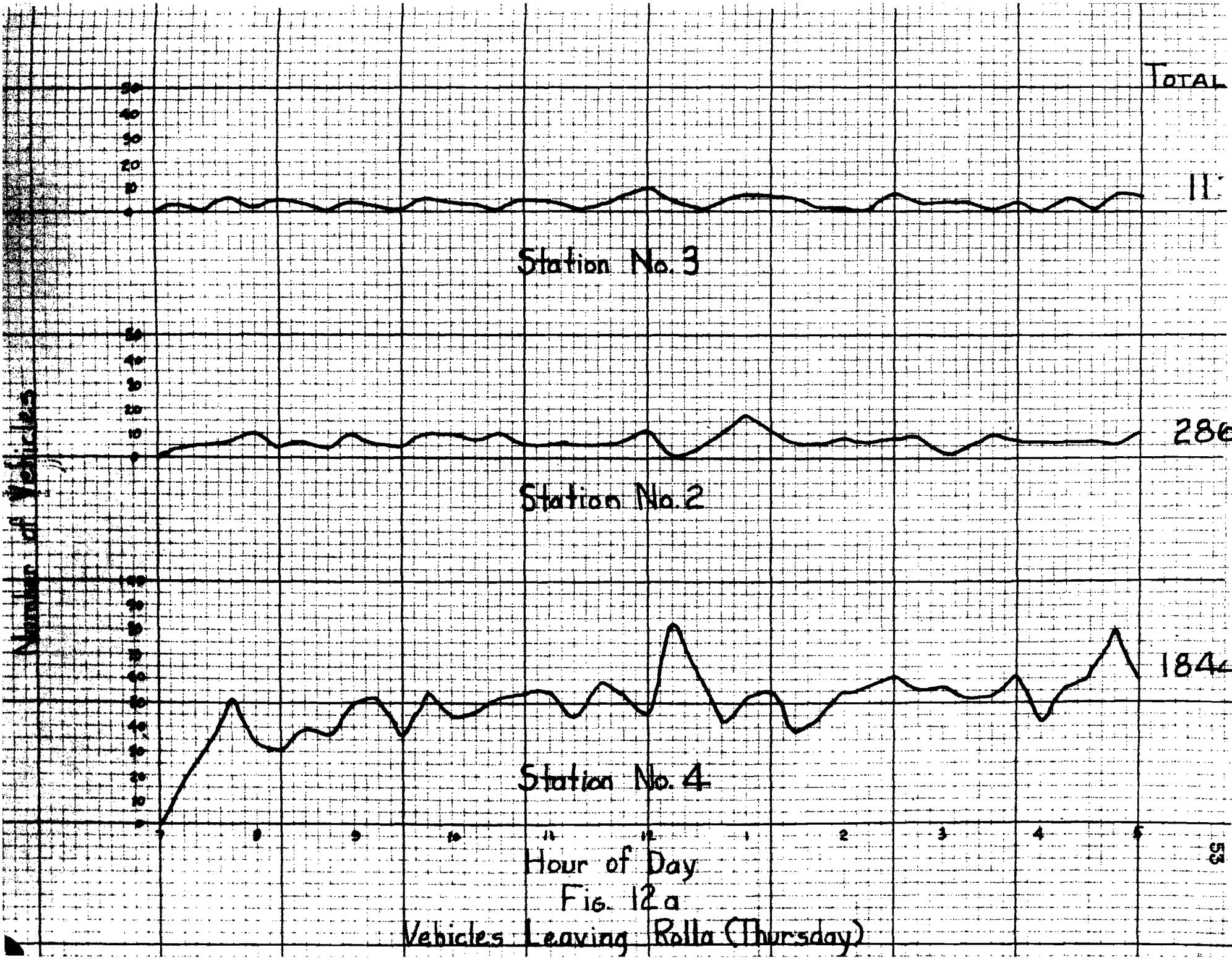


Fig. 12a

Vehicles Leaving Rolla (Thursday)

VEHICLES ENTERING ROLLA (Friday)

Sta.	Local	Foreign	Heavy Trucks	Light Trucks	Others	Total Vehicles	%
1	1299	410	159	364	37	2269	31
2	224	19	10	85	4	342	5
3	102	3	10	26	6	147	2
4	1052	468	176	310	27	2033	28
6	101	4	9	22	4	140	2
7	384	14	25	96	50	569	8
8	410	15	22	111	30	588	8
9	191	7	16	46	8	268	4
10	688	40	14	242	16	981	14
Total	4451	980	441	1303	182	7337	100
%	60	13	6	18	3	100	

VEHICLES LEAVING ROLLA (Friday)

1	1578	502	192	450	31	2855	35
2	225	31	9	76	4	345	5
3	85	7	7	30	4	133	2
4	1132	464	140	289	27	2052	28
6	65	3	2	13	2	85	1
7	348	14	16	77	29	484	6
8	334	24	24	119	6	507	7
9	211	7	20	47	11	296	4
10	868	81	17	282	14	908	12
Total	4845	1165	427	1360	130	7865	100
%	59	15	6	18	2	100	

TABLE VII

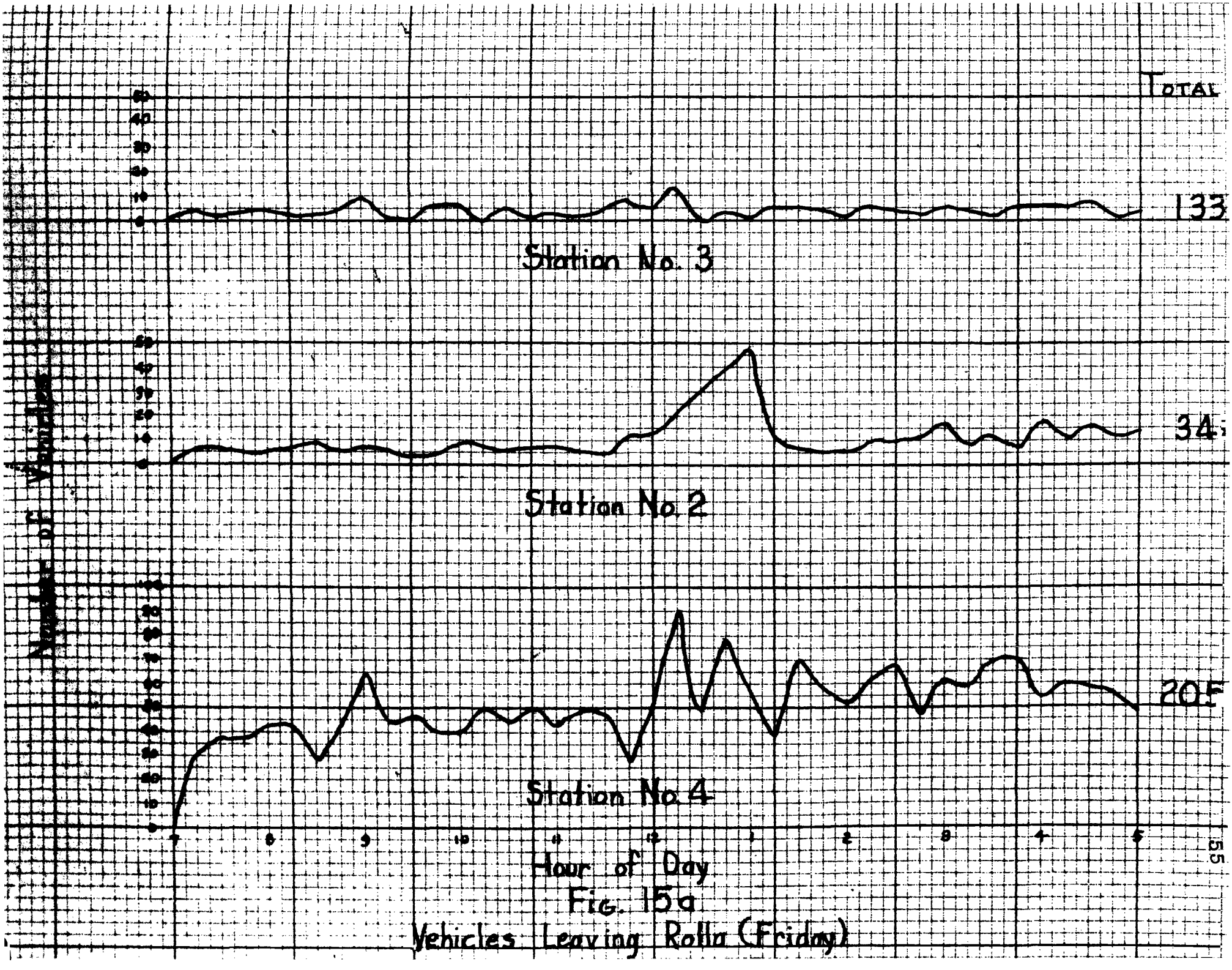


Fig. 15a

Vehicles Leaving Rolla (Friday)

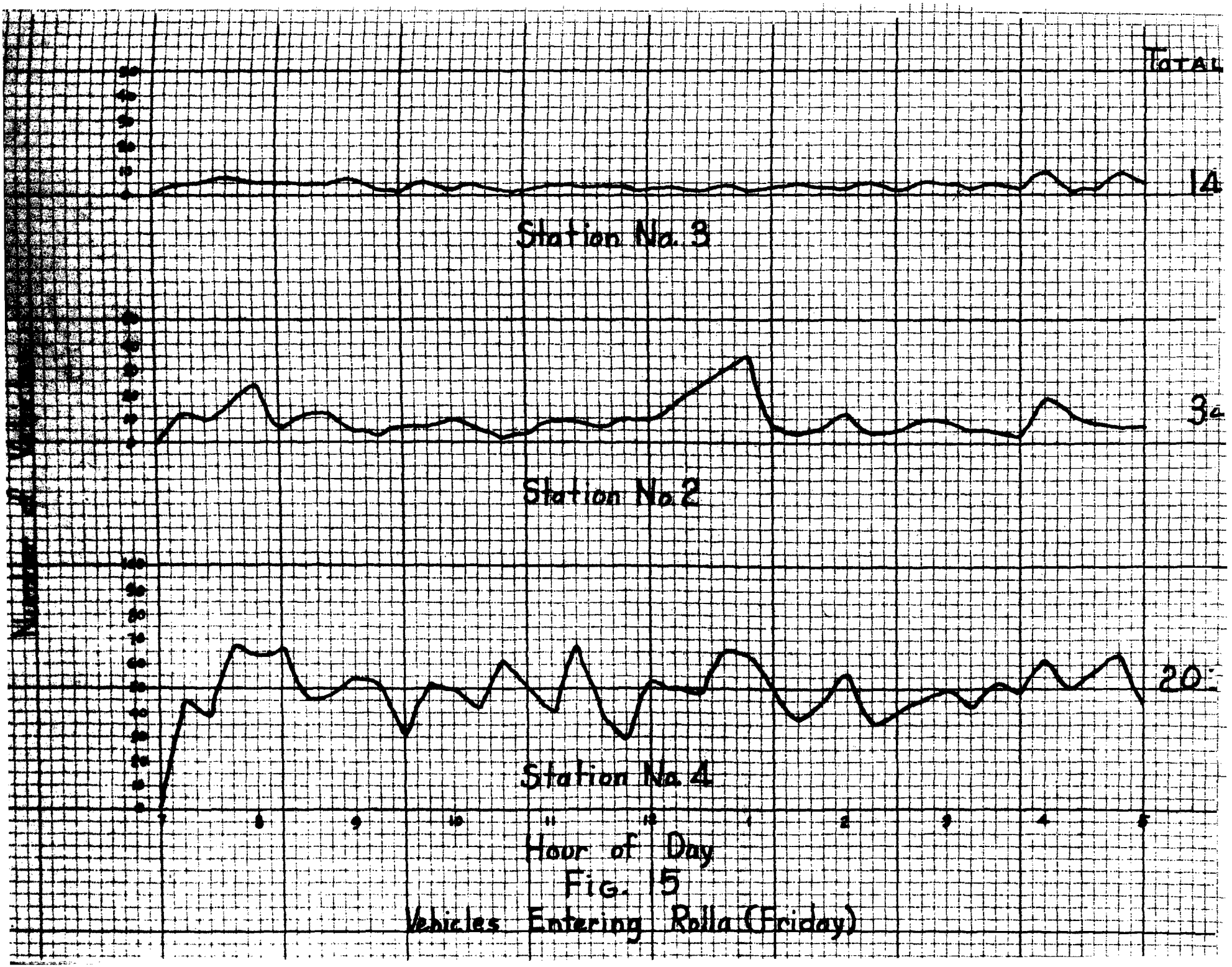


Fig. 15

Vehicles Entering Rolla (Friday)

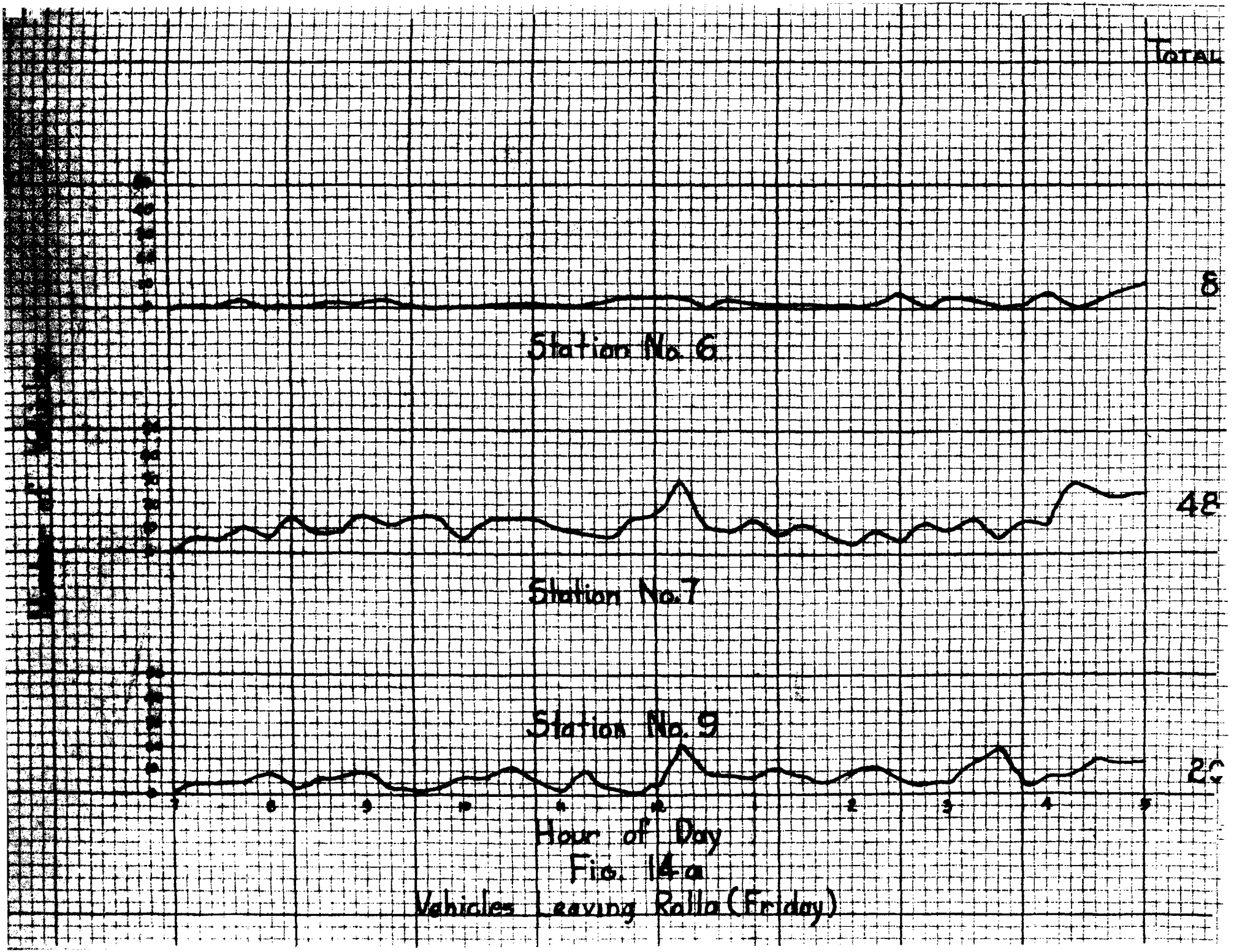


Fig. 14a

Vehicles Leaving Rolla (Friday)

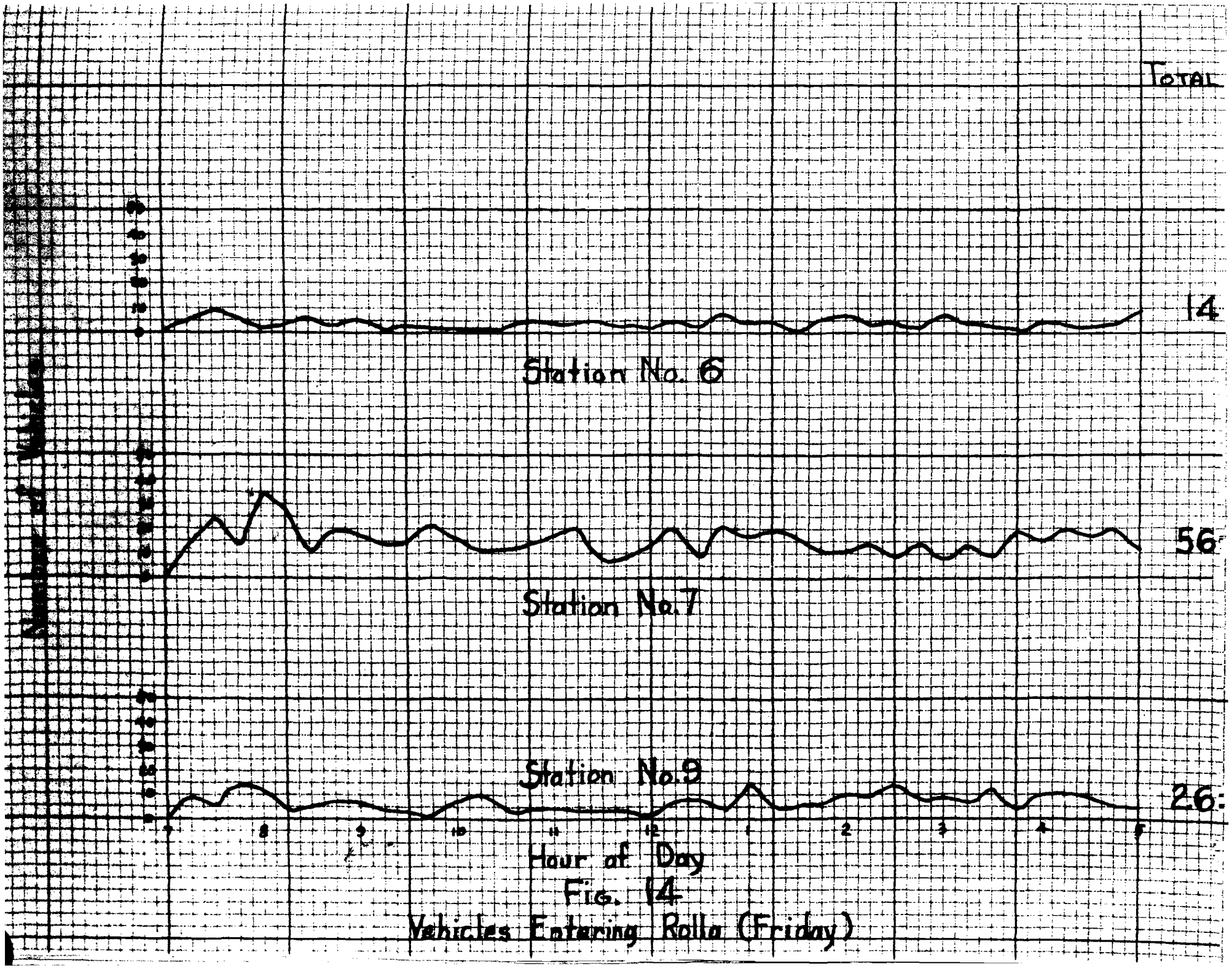


Fig. 14

Vehicles Entering Rolla (Friday)

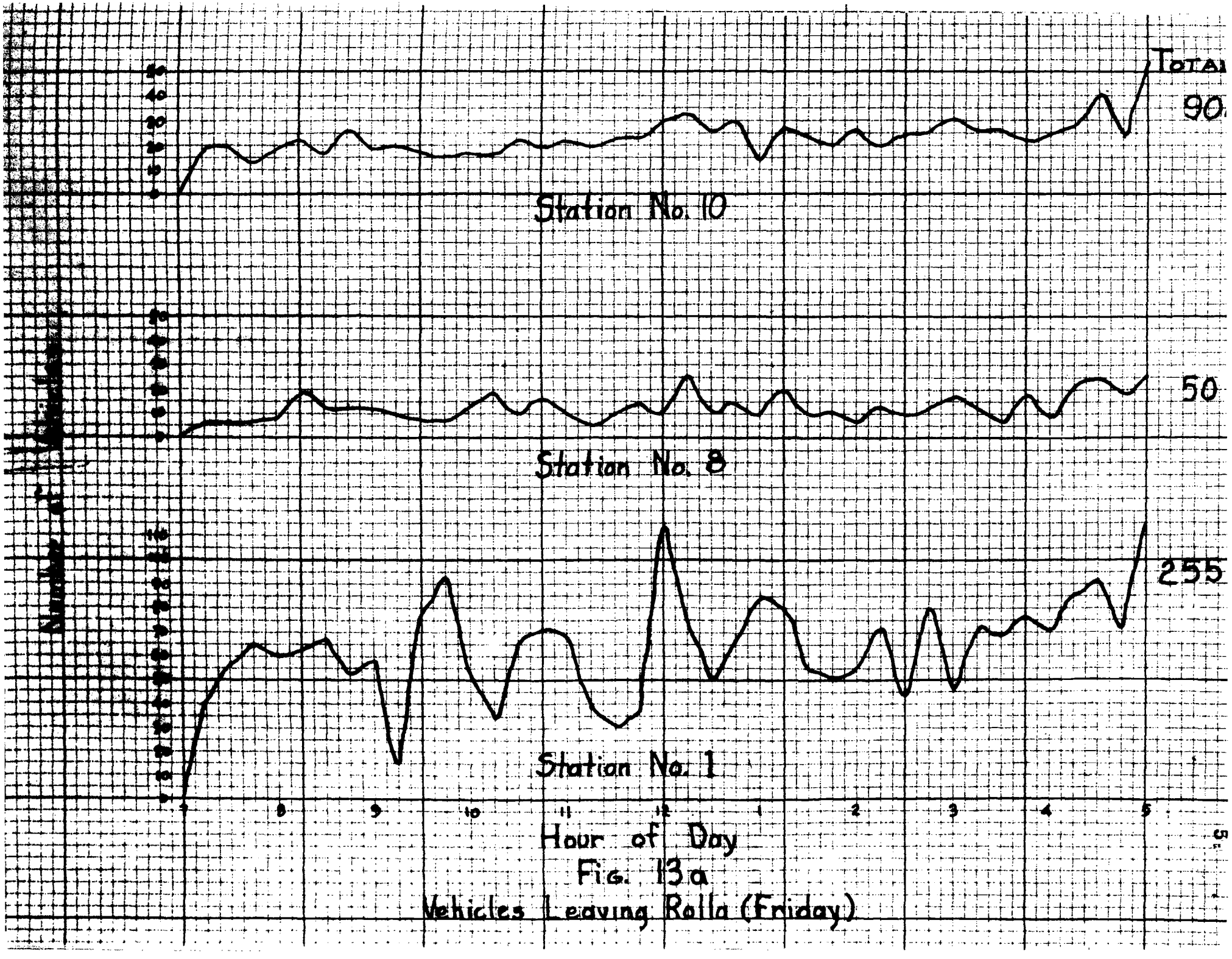


Fig. 13a
Vehicles Leaving Rolla (Friday)

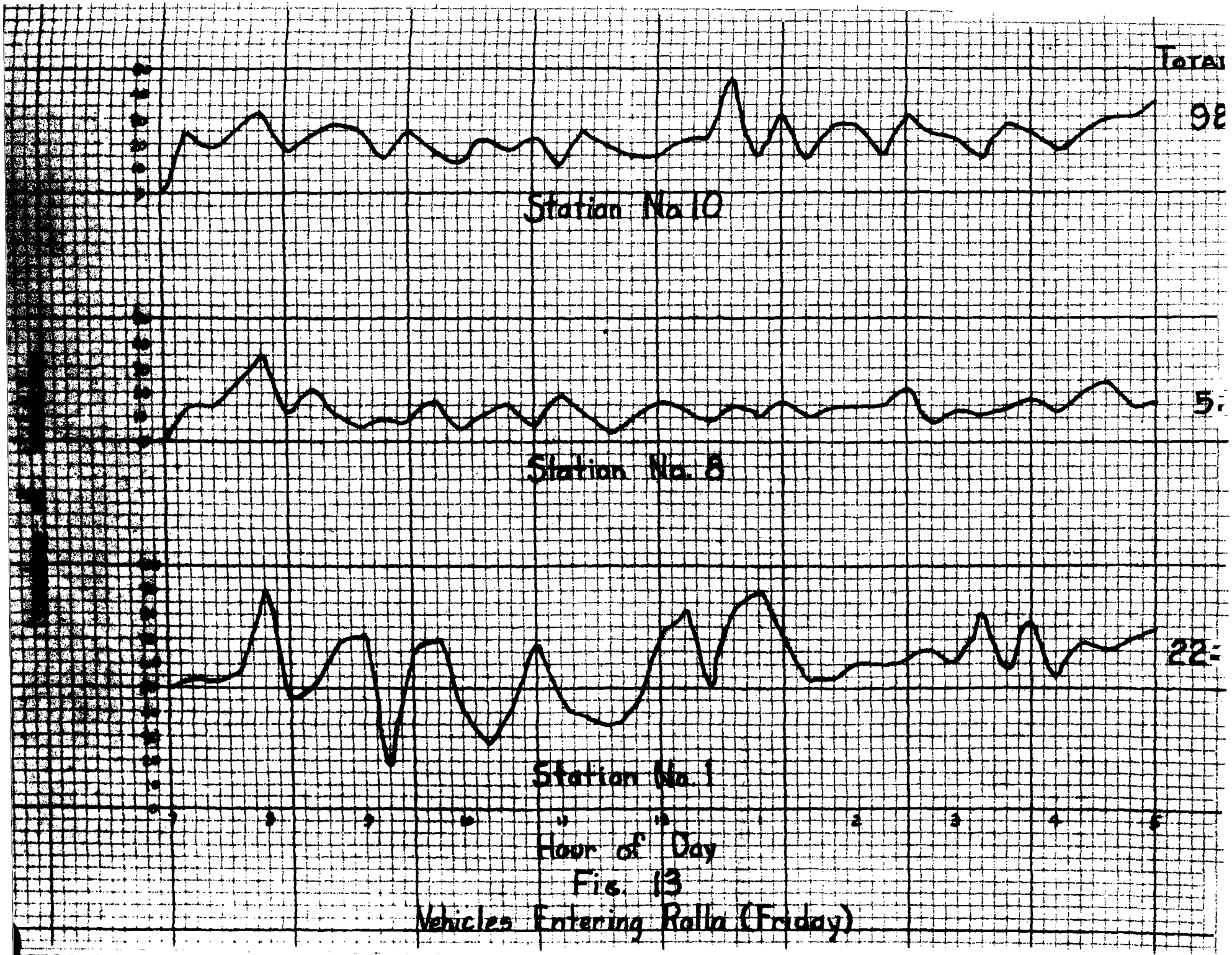


Fig. 13

Vehicles Entering Rolla (Friday)

PART II

The Internal Survey

CHAPTER I

Preliminary Arrangements

The purpose of the internal portion of the survey is to create a picture in regard to what particular streets or sections within the city limits carry the maximum amount of traffic; where areas of maximum density occur, the directions of the maximum flows and the capacities of certain streets.

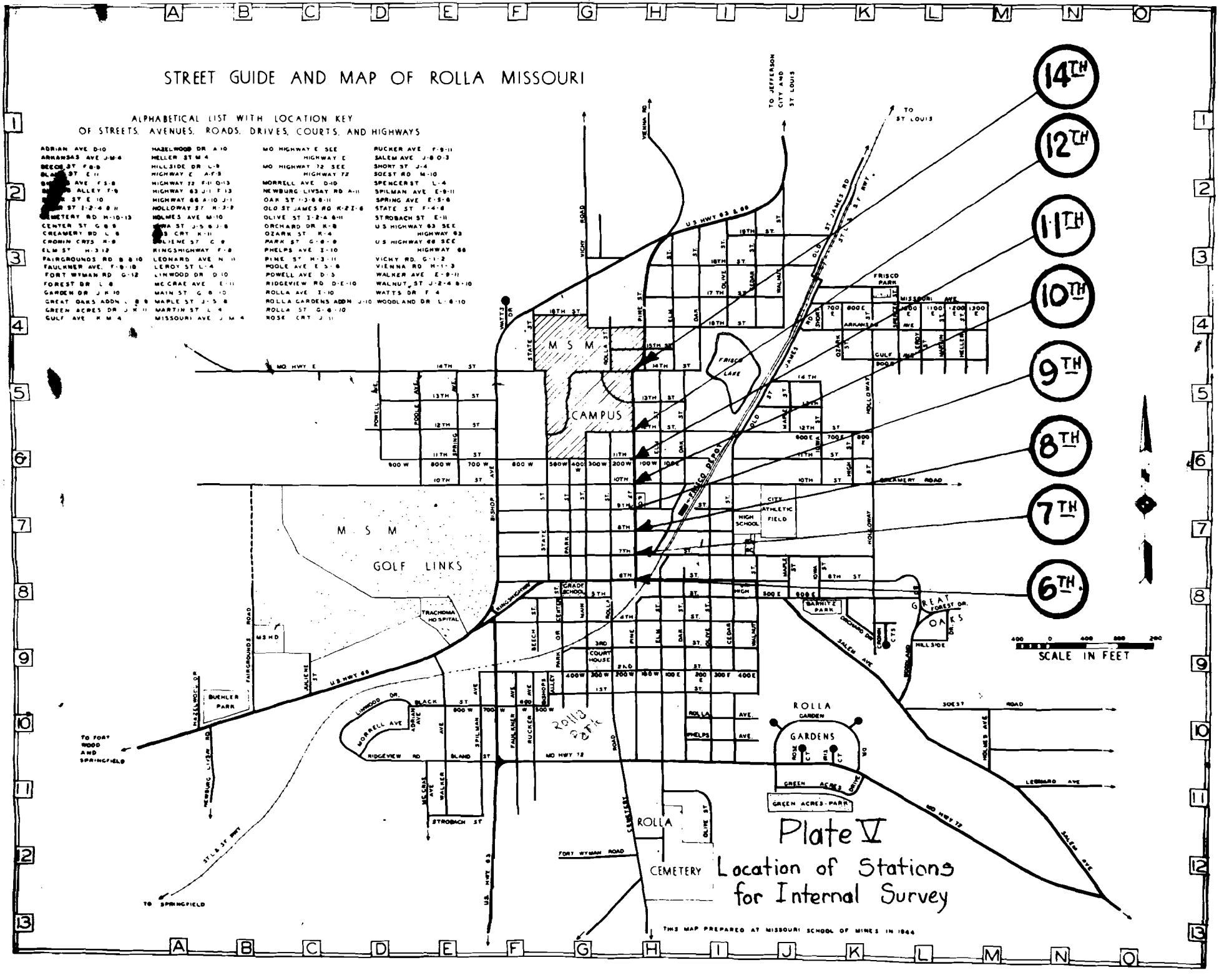
In making an internal survey the usual procedure for large cities is to zone the city and go through the process of home interviews for the purpose of determining how many trips an individual car owner makes a day, where he goes, what time of the day he makes the trip, and what street or streets he travels in getting to his destination.

The internal survey for Rolla was considerably altered and the following method was substituted:

Strategic stations were created for the purpose of counting vehicles from all directions with the idea in mind that if the stations were located properly and there were a sufficient number, the trend of traffic would present itself.

With this view in mind the following stations were established for the purpose of counting vehicles on a ten hour basis, from 7:00 a.m. to 5:00 p.m., Monday through Friday (See Plate V).

STREET GUIDE AND MAP OF ROLLA MISSOURI



Station No. 6th Intersection Pine and 6th Streets

Station No. 7th Intersection Pine and 7th Streets

Station No. 8th Intersection Pine and 8th Streets

Station No. 9th Intersection Pine and 9th Streets

Station No. 10th Intersection Pine and 10th Streets

Station No. 11th Intersection Pine and 11th Streets

Station No. 12th Intersection Pine and 12th Streets

Station No. 14th Intersection Pine and 14th Streets

In addition to the above, the information derived from the counts of Stations 1, 2, 3, 4, 6, 7, 8, 9, and 10 used in the external portion of the survey were utilized insofar as they affected the particular streets at which they were located. (See Plate I, Part I)

Further stations were created for the purpose of obtaining more complete information as follows: (See Plate VI)

Station A Intersection of 18th Street and Frisco R.R.

Station B Intersection of 12th Street and Frisco R.R.

Station C Intersection of 8th Street and Frisco R.R.

Station D Intersection of 7th Street and Frisco R.R.

Station E Intersection of Rolla Street and Frisco R.R.

Station F Intersection of 8th and Cedar Streets

Station G Intersection of 7th and Cedar Streets

Station H Intersection of 6th and Cedar Streets

Station I Intersection of 9th Street and Frisco Right of way

At stations A to I inclusive short counts were taken in the following manner:(3)

STREET GUIDE AND MAP OF ROLLA MISSOURI

ALPHABETICAL LIST WITH LOCATION KEY
OF STREETS, AVENUES, ROADS, DRIVES, COURTS AND HIGHWAYS

ADRIAN AVE D-10
ARKANSAS AVE J-M 4
BEECH ST F-8-8
BLAND ST E-11
BISHOPS AVE F-8
BISHOPS ALLEY F-8
BLACK ST E-10
CEDAR ST E-2-4-8-11
CEMETERY RD H-10-13
CENTER ST G-8-9
CREAMERY RD L-8
CROWN CRTS K-8
ELM ST H-3-12
FAIRGROUNDS RD B-8-10
FAULKNER AVE. F-9-10
FORT WYMAN RD G-12
FOREST DR L-8
GARDEN DR J-K 10
GREAT OAKS ADDN L-8-9
GREEN ACRES DR J-K 11
GULF AVE K-M 4
HAZELWOOD DR A-10
HELLER ST M-4
HILLSIDE DR L-9
HIGHWAY E A-F 5
HIGHWAY 72 F-I 0-13
HIGHWAY 63 J-K 13
HIGHWAY 66 A-10 J-L
HOLLOWAY ST K-3 9
HOLMES AVE M-10
IOWA ST J-5-8-9
IRIS CRT K-11
JULIENE ST G-9
KINGSHIGHWAY F-8
LEONARD AVE N-11
LEROY ST L-4
LINWOOD DR G-10
MC CRAE AVE E-11
MAIN ST G-8-10
MAPLE ST J-5-8
MARY ST L-4
MISSOURI AVE J-M 4
MO HIGHWAY E SEE HIGHWAY E
MO HIGHWAY 72 SEE HIGHWAY 72
MORRELL AVE D-10
NEWBURG LIVSAY RD A-11
OAK ST H-3-8-11
OLD ST JAMES RD K-2-3-8
OLIVE ST I-2-4 8-11
ORCHARD DR K-8
OZARK ST K-4
PARK ST G-8-9
PHELPS AVE I-10
PINE ST H-3-11
POOLE AVE E-5-8
POWELL AVE D-5
RIDGEVIEW RD D-E-10
ROLLA AVE I-10
ROLLA GARDENS ADDN J-10
ROLLA ST G-8-10
ROSE CRT J-11
RUCKER AVE F-9-11
SALEM AVE J-8 0-3
SHORT ST J-4
SOEST RD M-10
SPENCER ST L-4
SPILMAN AVE E-8-11
SPRING AVE E-5-8
STATE ST F-4-8
ST ROBACH ST E-11
U S HIGHWAY 63 SEE HIGHWAY 63
U S HIGHWAY 66 SEE HIGHWAY 66
VICHY RD G-11-2
VIENNA RD H-11-3
WALKER AVE E-9-11
WALNUT ST J-2-4 8-10
WATTS DR F-4
WOODLAND DR L-8-10

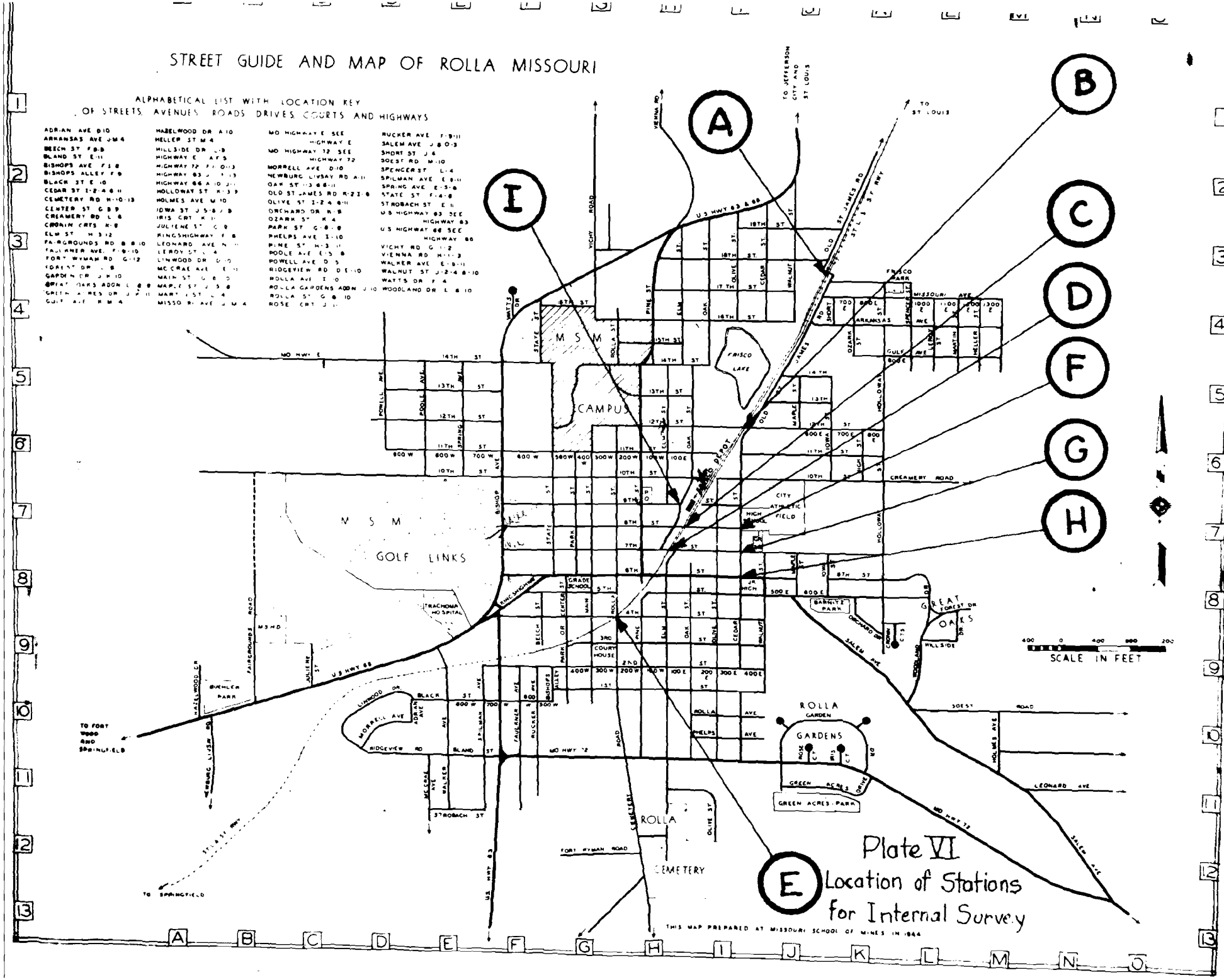


Plate VI
Location of Stations
for Internal Survey

THIS MAP PREPARED AT MISSOURI SCHOOL OF MINES IN 1944

C4

(3) Bulletin of the University of Wisconsin "A Method of Making Short Traffic Counts and Estimating Traffic Circulation in Urban Areas"

Half-hour counts were taken in the morning between the hours of 9:15 and 11:15 and half-hour counts were taken in the afternoon between the hours of 1:45 and 3:45.

To determine the vehicular circulation in cities under 25,000 for a 12-hour period a multiplying constant of 39 for the forenoon, and a constant of 21 for the afternoon were used.

These constants were computed by data obtained from the Barney Link Fellowship, University of Wisconsin. The data coming from the average per cent of vehicular traffic passing locations in six typical towns throughout the United States whose populations were less than 25,000. The total average percentage for the morning being 0.0258 and for the afternoon 0.0477. Dividing one vehicle by these percentages, the constants referred to above can be obtained as follows:

$$\frac{1 \text{ vehicle}}{0.0258 \text{ Total Average percentage for a.m.}} = 38.8 \text{ or } 39, \text{ The Constant a.m. Multiplying Factor for Cities Under } 25{,}000$$

$$\frac{1 \text{ vehicle}}{0.0477 \text{ Total Average Percentage for p.m.}} = 20.9 \text{ or } 21, \text{ The Constant p.m. Multiplying Factor for Cities Under } 25{,}000$$

For example, suppose in a city of 12,000 the vehicular circulation on a street was 155 cars from 9:15 to 9:45 a.m. and 210 cars from 3:15 to 3:45 p.m. The estimated 12-hour

circulation using the multiplying factors would be:

39 x 155 = 6045 Twelve hour circulation

21 x 210 = 4410 Twelve hour circulation

$$\frac{6045 + 4410}{2} = \frac{10455}{2} = 5228 \text{ vehicles}$$

or the estimated vehicular circulation for a 12-hour period was 5228 vehicles. If the information desired is on a 10-hour basis a factor of 10/12 or 0.8333 should be used. For a 10-hour period the above results would be as follows:

5228 x 0.8333 = 4356 vehicles.

The same type of tally sheet was used in the internal portion of the survey that was used in making the external survey, however, no particular attention should be made as to the type of vehicles encountered as the total number and direction of the vehicles are the governing factors.

The internal survey should run for a five-day period as in the external survey and daily from 7:00 a.m. to 5:00 p.m., the survey can be extended to include whatever hours are necessary; however, like in the external survey, Saturdays, Sundays, holidays and other nonrepresentative days should be omitted as they are not characteristic of the entire week. (4)

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(4) op. cit. p. 4

The problems and difficulties of mustering enough personnel to count vehicles for the internal survey will be encountered the same as in the external survey. The same form

as shown by Plate IV, Part I, should be used in listing personnel.

The number of personnel required for counting vehicles will vary as in the external survey, with the number of stations selected. A summary of the personnel used for the Rolla internal survey is as follows:

FOR THE TEN-HOUR COUNT

Day	Sta. 6th	Sta. 7th	Sta. 8th	Sta. 9th	Sta. 10th	Sta. 11th	Sta. 12th	Sta. 14th	Total
Mon.	8	10	10	7	10	9	10	8	72
Tues.	8	8	8	11	10	9	10	10	74
Wed.	6	7	6	6	7	4	6	6	48
Thur.	10	10	10	10	10	10	10	10	80
Fri.	9	10	11	9	10	9	11	9	78
Total	41	45	45	43	47	41	47	41	352

Total number of hours 7:00 a.m. to 5:00 p.m. = 10

Total number of Stations = 8

Total number of Station hours per day = 80

Total number of Station hours for 5 days = 400

Average time each personnel counted = $\frac{400}{352}$ = 1.14 hrs.

FOR THE HALF-HOUR COUNT

For the half-hour count, 9 stations were selected (See Plate VI). Therefore 9 counters were required in the forenoon and 9 in the afternoon making a total of 18 counters.

The system used for issuing and returning tally sheets and clip boards should be adhered to as in the external portion of the survey.

CHAPTER II

The Internal Count

The internal count for the Survey of Rolla for the 10-hour day, 5-day period, was made at the same time the external count was taken, with the exception of Stations A to I inclusive. The stations used are shown by Plate V and are all situated along Pine Street at intersections of 14th, 12th, 11th, 10th, 9th, 8th, 7th, and 6th Streets. Pine Street being the main artery of travel, it was assumed that 90% of the traffic would eventually use this thoroughfare.

Stations A, B, C, D, and E (See Plate VI) are all half-hour count stations and are all grade crossings of the St. Louis-San Francisco Railway Company. It was further assumed that 90% of the internal traffic of Rolla would pass these points during the day owing to the fact that the railroad separates the city into two distinct parts and connects them by a limited number of crossings.

Stations F, G, and H, (See Plate VI) are also half-hour count stations and are located along Cedar Street at intersections of 6th, 7th, and 8th Streets.

Station I, (See Plate VI) is a half-hour count station and was used for the purpose of determining the amount of traffic using the Railroad right of way in the vicinity of the railroad passenger station.

Figures 16 to 23 inclusive show the vehicular traffic

entering and leaving stations along Pine Street from 6th to 14th Streets; figures 24 to 32 inclusive show the vehicular traffic entering and leaving stations 1, 2, 3, 4, 6, 7, 8, 9, and 10, (See Plate I) and figures 33 to 41 inclusive show the vehicular traffic entering and leaving stations A to I inclusive.

From figures 16 to 22 inclusive, information relative to the capacity of Pine Street between 6th and 12th Streets is as follows:

VEHICLES USING WEST LANE

Between 6th Street and 7th Street.....1492 vehicles
Between 7th Street and 8th Street.....1741 vehicles
Between 8th Street and 9th Street.....1916 vehicles
Between 9th Street and 10th Street.....2157 vehicles
Between 10th Street and 11th Street.....2168 vehicles
Between 11th Street and 12th Street.....2145 vehicles

Total 11619 vehicles
Average 1937 vehicles

VEHICLES USING EAST LANE

Between 6th Street and 7th Street.....1750 vehicles
Between 7th Street and 8th Street.....1702 vehicles
Between 8th Street and 9th Street.....2000 vehicles
Between 9th Street and 10th Street.....1855 vehicles
Between 10th Street and 11th Street.....1800 vehicles
Between 11th Street and 12th Street.....1485 vehicles

Total 10590 vehicles
Average 1765 vehicles

Average number of vehicles using either lane is

$$\frac{1937 + 1765}{2} = 1851 \text{ vehicles.}$$

This amounts to 1851 vehicles for a ten-hour period or for one-hour, the average capacity of Pine Street between 6th and 12th Streets would be 185 vehicles.

The free-moving traffic capacity of traffic lanes on city streets varies over a wide range. The traffic on city streets is slower than on rural highways, which tends to raise the capacity; but the presence of buses, pedestrians, parking spaces and frequent intersections interfers with the movement of vehicles to a great extent.

Numerous formulas have been proposed for determining theoretical traffic capacities, the following will be used for the Rolla Survey. (5)

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(5) Reprinted by permission from Highway Engineering by J. H. Bateman, published by John Wiley & Sons, Inc.

$$N = \frac{5280V}{1.1V + 20}$$

N = Number of vehicles per hour

V = Speed of vehicle (20 miles per hour)

$$N = \frac{5280 \times 20}{1.1 \times 20 + 20} = 2514 \text{ vehicles}$$

In other words, the theoretical capacity of Pine Street is 2514 vehicles per hour.

It is obviously impossible to develop precise values for street capacities. Numerous investigations of street

traffic have been made and certain deductions should be made from the theoretical value.

Starting with the theoretical value of 2514 vehicles, the following deductions will be made:

(1) 50% for the interference of cross-traffic, which will leave a balance of 1257 vehicles.

(2) 30% for the stopping of a lane of traffic, leaving a balance of 880 vehicles.

(3) 20% for vehicles turning left, leaving a balance of 704 vehicles.

(4) 30% for parking lots, filling stations or garages, leaving a balance of 493 vehicles.

(5) 50% for curb parking, leaving a balance of 247 vehicles.

(6) 20% for vehicles illegally parking, leaving a balance of 198 vehicles.

In other words, the capacity of Pine Street, between 6th and 12th Streets is 198 vehicles per hour.

From the foregoing it appears that Pine Street is not carrying the traffic that it should as it is capable of transmitting 198 vehicles per hour whereas only 185 actually use it. To express it in another way, Pine Street has fallen below its rated capacity thereby becoming antiquated. This will be discussed further in Chapter XII.

Figure 48, which is a recapitulation of Figures 16 to 33 inclusive, shows the amount of traffic entering and leav-

ing Pine Street from the various streets that it intersects.

It will be noted that 6th Street is the first in importance, carrying 2820 vehicles west and 2363 vehicles east. This was to be expected as 6th Street accommodates that traffic entering Rolla from the Southwest, South and Southeast. It is further interesting to note that of the 1154 vehicles coming from the east on 6th Street, only 352 (See Fig. 30) originate from the Southeast (Station No. 8). This means that 802 vehicles find their way to the intersection of 6th and Pine from that area marked "A" on Plate VII. Of the 1471 vehicles coming from the West on 6th Street, 1017 originate from the Southwest (Station No. 1) and 251 originate from South (Station No. 9), leaving a balance of only 203 vehicles finding their way to the intersection of 6th and Pine from that area marked "B" on Plate VII.

The amount of traffic originating from Ridgeview Addition, Area "Q" on Plate VII, may be calculated by taking the number of vehicles leaving Station No. 10 going North which is 840 vehicles, subtracting this value from the number of vehicles entering Station No. 1 from the South, which amounts to 1044 vehicles and adding to this difference the number of vehicles entering Station No. 10 from Bland Street and turning left, which is 54 vehicles; this amounts to 258 vehicles originating from Ridgeview Addition. Of course,

a large percentage of these vehicles continue north or turn southwest after leaving Station No. 1 and do not affect the volume of traffic entering 6th Street.

The streets carrying the next greatest volume of traffic are East 9th and 8th, having totals of 1304 and 1301 respectively, with East 7th Street running a close fourth having 1258 vehicles. The industrial district in the vicinity of the shoe factory accounts for the volume of traffic on East 7th Street and East 8th Street and in addition they are railroad crossing points. The volume of traffic using East 9th Street, where a railroad crossing does not exist, is explained by the fact that almost 90% of this traffic utilizes the railway right of way between 8th and 9th Streets, rather than using 8th and Pine Streets where they will have the possibility of being detained by Rolla's one and only automatic traffic signal.

The amount of traffic using the railroad right of way, between 8th and 9th Streets is shown by Figures 35 and 41. Figure 35 shows a total of 1441 vehicles using the 8th Street inlet and outlet and Figure 41 shows a total of 1565 using the 9th Street inlet and outlet.

Figure 42 indicates that West 11th and East 12th Streets are the next in importance insofar as volume of traffic is concerned, carrying a total of 1246 and 1234vehicles respectively. The volume of traffic using East 12th Street is again explained by this street having one of the railroad

crossings. The volume of traffic using West 11th Street is accounted for by the fact that a large percentage of the traffic from East 12th Street utilizes that thoroughfare instead of West 12th Street as West 12th Street terminates in that direction at the Missouri School of Mines campus.

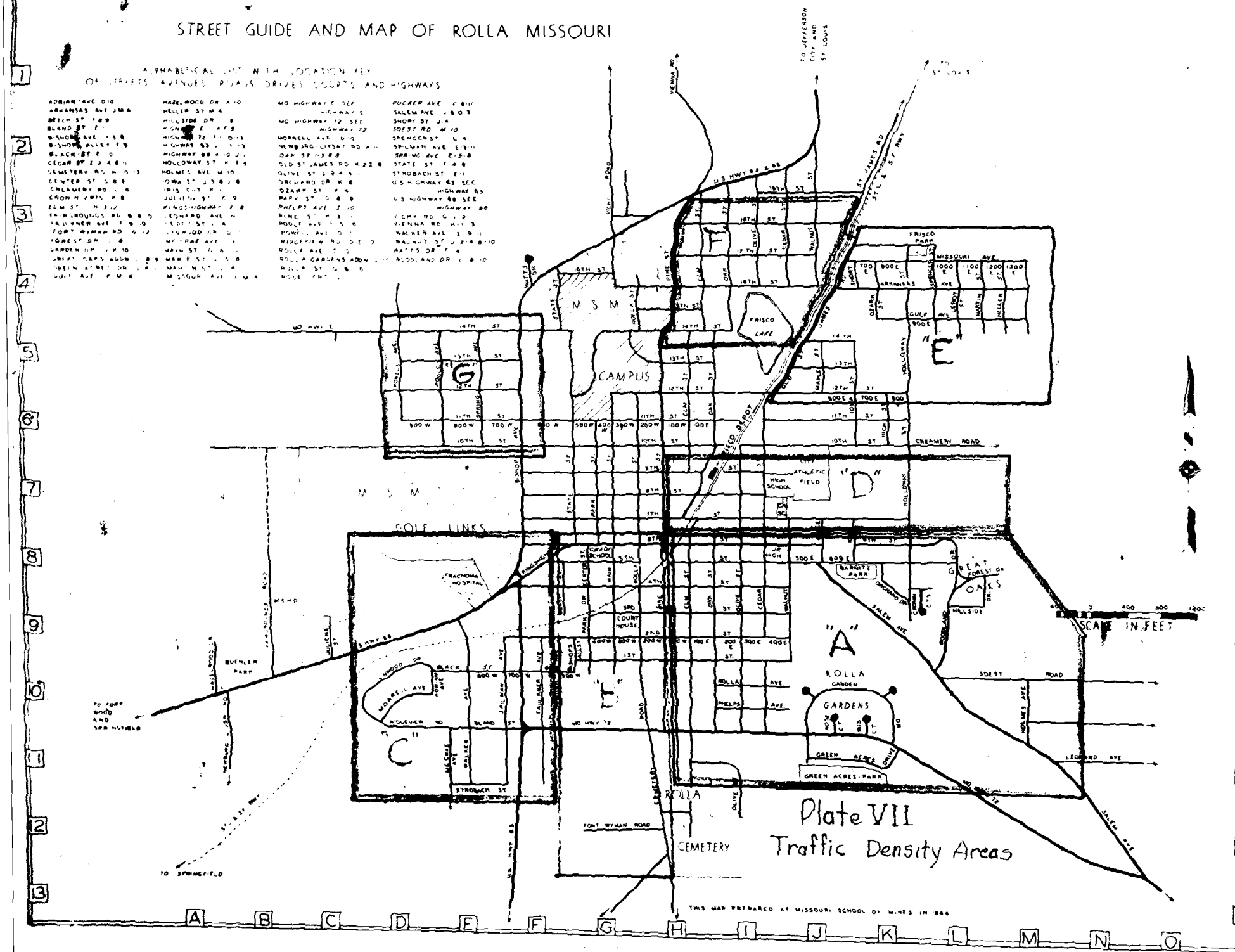
The popular belief that West 10th Street is of the most importance considering the volume of traffic west of Pine Street is not verified by the survey. From Figure 42 it will be noted that 6th, 11th, 8th, 9th, 7th, and 10th Streets, carrying the volume of traffic in the order listed, 10th Street being the least.

The volume of traffic using that area designated by "F" on Plate VII presents no immediate problem as most of this traffic remains west of the railroad, however, that area designated by "E" on Plate VII is expanding rapidly, moving in a northeasterly direction and will, in the not too distant future, utilize area "F" for its traffic movement, as it will be more convenient to use the 18th Street crossing, however bad it might be, in reaching the northwest and west points of the city.

The vehicles using that area designated by "G" on Plate VII also presents no immediate problem insofar as volume is concerned. However, a problem does exist in the nature of safely crossing Bishop Avenue, which is the present location of U.S. 66. This area is also expanding quite

rapidly and should be given some serious thought--more will be discussed about this in Chapter III.

STREET GUIDE AND MAP OF ROLLA MISSOURI



CHAPTER III

Conclusions

The most important part of the internal traffic situation in Rolla to consider is the remedial action that should be taken in regard to Pine Street. Since Pine Street has fallen below its rated capacity, thus becoming antiquated, something should be done to bring it up to date and bringing this street up to date means only widening. Of course Pine Street can be widened by eliminating the landscape between curb and sidewalks and also by reducing the width of sidewalks, but I believe this course of action is in bad taste and should be taken only in extreme emergencies. The other alternative, and this should have been started 25 years ago, is for the City Council to enact a city set-back ordinance, wherein property owners along Pine Street would be compelled, in the event new construction takes place or when old structures have served their purpose and must be replaced, to set back 10, 15, or 20 feet from the original street line. If such a law were enacted years ago, with all the new construction that has taken place Pine Street would today be approaching the making of a wide thoroughfare.

This type of action will always have the non-support of a certain number of property owners who maintain selfish interests above community spirit and pride, but their consideration must be secondary to that vast majority of citi-

zens who make up the community and who use Pine Street many times each day as a means of moving from one part of the city to another.

The set-back type of action takes many years before success can be achieved and as previously stated, it should have been started many years ago. However, it is never too late to take such action if Pine Street is to adequately serve the people of Rolla. If traffic along Pine Street becomes too congested in the very near future, and there are indications that this may come about, steps should be taken to eliminate the landscape areas and to reduce the width of sidewalks as an extreme emergency.

A considerable amount of thought should be given to the traffic situation included in area "E" shown on Plate VII. As previously stated, this area is expanding rapidly and steps should be taken toward improving the present railway crossings, which afford outlets of this area to the west and southwest. A considerable portion of this traffic utilizes the 12th Street crossing, the most hazardous crossing throughout the entire city, because of natural existing conditions. The traffic north of Gulf Avenue uses Holloway Street as a southern outlet; it is quite natural for this traffic to turn west on 12th Street as 12th Street is paved as far east as Holloway. If Holloway Street were improved south of 12th Street, most of this traffic would continue south to 7th Street, thereby reducing the number

of vehicles using the 12th Street crossing.

Traffic going from area "E" to area "F" (See Plate VII) have the choice of using the 12th Street or 18th Street crossings. The 18th Street crossing is the most convenient but also the more dangerous, therefore, a considerable amount of this traffic will use the 12th Street crossing, going far out of their way, rather than risk the 18th Street crossing. In this connection, a subway under the railway would be most desirable connecting 16th Street and Arkansas Avenue.

The traffic entering area "A" (See Plate VII) from the southeast and desiring to continue north of Rolla, has no other alternative than to proceed along Salem Avenue, 5th Street, Walnut Street, 6th Street, Pine Street and north to U.S. 66. In this connection, if Holloway Street were to be opened to Salem Avenue, a mere distance of 300 feet more or less, all of this traffic would utilize this outlet thereby relieving the business district traffic situation. In this connection a subway under the railway in the vicinity of 16th Street would be most advantageous.

As shown by Figure 42, the intersection of 6th and Pine Streets carries the maximum amount of traffic insofar as the business district is concerned. This condition could be improved if steps were taken toward the continuation of Pine Street south under the railway, see Figure 46, Part III. This again necessitates the construction

of a subway under the railway. This improvement would go far toward eliminating a considerable amount of congestion at this intersection as well as reducing the number of vehicles that would ordinarily use east and west 6th Street in traveling south and southeast to and from Rolla.

A traffic survey of this type would not be complete without commenting upon the merits or demerits of the automatic traffic signal situated at the intersection of 8th and Pine Streets.

From Figure 42 it will be noted that the east and west traffic along 8th Street with a total of 2469 vehicles exceeds that of any other, with the exception of 6th Street, whose total number of vehicles is 5183. As far as the north and south traffic along Pine Street is concerned, there is no appreciable difference between any corner, as can be seen by Figures 16 to 23 inclusive. Therefore, if the amount of vehicular traffic concerned is the criterion as to the proper location of a traffic signal, it appears that the 6th Street intersection would have the preference over the 8th Street location. However, it is very well known that a traffic signal located at 6th and Pine Streets would be absolutely unnecessary. True, the 6th Street intersection has only 3 outlets, but nevertheless the volume of traffic is there.

The purpose of any traffic signal is to momentarily break the continuity of a more heavily traveled street thereby giving cross-traffic a chance to enter the inter-

section. In this respect, automatic signals, if properly located, will usually serve their purpose providing the volume of traffic is heavy and fairly uniform throughout the day.

This is not the case insofar as the intersection at 8th and Pine Streets is concerned, or for that matter, any other location within the City of Rolla. There are times during the day when the volume of traffic may merit an automatic traffic signal, they are usually the periods of peak flows, 11:45 a.m. to 12:15 p.m., 12:45 p.m. to 1:15 p.m., and 4:45 p.m. to 5:30 p.m. At all other times the traffic signal becomes more of a nuisance than a necessity.

It is my opinion that the automatic traffic signal located at the intersection of 8th and Pine Streets should be replaced by some type of electric cautionary (blinking) signal. In addition, a similar type of signal should be provided at the intersection of 6th and Pine Streetsand at 11th and Pine Street.

PART III

Miscellaneous Considerations

In this part of the survey, various existing features throughout the city which are detrimental to good traffic conditions will be considered and recommendations made toward their improvement.

Railroad Crossings

It has been previously stated that the Frisco Railway is responsible for a good portion of Rolla's traffic problems owing to the limited number and location of good crossings that are available.

Throughout the city, the Railroad Company has supplied the following crossings:

18th Street, grade crossing (very poor) (See Fig. 45)

12th Street, grade crossing (very poor) (See Fig. 44)

8th Street, grade crossing (fair)

7th Street, grade crossing (fair)

6th Street, grade crossing (very poor)

Rolla Street, grade crossing (very poor)

Main Street, overhead (very poor)

Route U.S. 63, underpass (excellent)

Walker Avenue, grade crossing (very poor)

From the above, one would conclude that the Railroad Company has treated Rolla bounteously, having supplied a total number of nine crossings throughout the city, but the facts bring to light a very different story.

Of the nine crossings that now exist, five of them--6th, 7th, 8th, Rolla, and Main Streets, all grade crossings--rated very poor to fair are adjacent to one another in as many blocks. These crossings probably served Rolla admirably forty years ago, but today are most undesirable, not only from a standpoint of safety, but also for the fact that they cause a great deal of delay to the people of Rolla when obstructed by moving or stationary freight or passenger trains. This condition is being aggravated by the advent of diesel power as a means of handling exceptionally long trains. It is not uncommon for all of these five crossings to be obstructed at the same time causing traffic to be delayed at the several points for an exceptional length of time.

The 12th and 18th Street crossings have previously been discussed in Part II (See Figures 44 and 45). Suffice it to say they are inadequate and extremely dangerous. The same applies to the Walker Avenue grade crossing.

The Main Street overhead, although considered very poor as a structure, gives a considerable amount of safe, unobstructed crossovers and consequently contributes much to better traffic conditions.

The remaining point of crossing, the underpass on U.S. 63, is the only adequate grade separation throughout the city.

The possibility and merits of a grade separation at

the south end of Pine Street has been previously discussed in Part II. Consideration should also be given to the construction of an overhead at 10th or 11th Streets and the construction of an underpass at 12th or 13th Streets.

If a high type structure were to be built at the south end of Pine Street and another at either 10th or 11th Street (See Figure 47) and a third at 16th Street, the traffic conditions throughout Rolla would be improved considerably.

Of course, this type of construction necessitates a considerable amount of expenditure both on the part of the Railroad as well as the city, but an expenditure that would eventually pay off in dividends.

While on the subject of railway crossings, it is not amiss to mention at this time the deplorable condition that exists in the vicinity of the Frisco Railway depot (See Figure 48a). I refer to that particular section of railway right of way northeast of the tracks and between 7th and 9th Streets. As indicated by Figures 28, 39, and 41, this thoroughfare carries a considerable volume of traffic and serious consideration should be given toward some type of pavement for this area.

Enforcement of Speed Limits

It is only humane to have reasonably safe driving speeds throughout the city and as a matter of law Rolla has made or is making ample provisions along this line. However, the enforcement of legal speeds has become somewhat lax and alarming.

I refer particularly to the excessive speeds used along U.S. 66 through the city. In spite of the numerous speed limit caution signs along this street, excessive speeds continue to exist causing due alarm to those residents living in area "C" shown on Plate VII. This is an alarming situation and immediate steps should be taken to compel this traffic to undergo a slowing down process. This can be accomplished by police patrol or by an automatic traffic signal placed either at 10th or 11th Streets.

Parking Situation

Double Parking Along Pine Street

This type of illegal parking seems to be more predominant in Rolla than in any other city of its size throughout the country. It not only incurs the wrath of that large percentage of local citizens who are ever striving to be good drivers, but in addition it must, without a doubt, leave a very poor impression, insofar as our city administration is concerned, with out-of-town visitors and those traveling through Rolla.

Of course, the reason for a great number of trucks double parking along Pine Street is accounted for by the fact that very few alleys are provided for the unloading and picking up of local freight. This condition has existed for many years and in as many years no steps have been taken by the city administration to remedy the situation.

Since the main reason for this type of traffic violation is a lack of alley accommodations, it is up to the city administration to take positive steps toward creating more alleyways. This can be taken care of like a set-back ordinance, previously referred to, and over a period of years ample alleyways would be provided.

Trucks Parking on Side Streets off U.S. 66

This type of hazardous parking is becoming more prevalent every day. It is not uncommon to encounter large semi-trailer vehicles parked throughout the night and day on cross streets, just off U.S. 66 (See Figure 49a). They not only limit the sight distance of vehicle drivers approaching U.S. 66, but in addition they create a very dangerous situation for those vehicles entering the side streets from U.S. 66. This condition is multiplied tremendously when rain falls during the hours of darkness.

If the existing city ordinances permit this type of parking, immediate steps should be taken by enacting a law making it illegal.

Corner Parking

In connection with city parking, some comment should be made in reference to the question of parking too close to corners (See Figure 49). Vehicles parking too close to corner intersections eliminate a considerable amount of sight distance causing side street vehicles to practically enter the intersection before they can ascertain if the way is clear, thus blocking pedestrian walkways and in addition

making it difficult, if not impossible for vehicles to enter the side street from the left or right.

I recommend that the city administration provide non-parking signs 15 feet from corners all along Pine Street and on each side street from 6th to 12th Streets inclusive. The non-parking hours should be 8:00 a.m. to 5:30 p.m., Monday through Saturday, with the exception of the intersections at 11th and Pine, 12th and Pine, 7th and Rolla, and 8th and Rolla, which should run to 9:30 p.m. and include Sundays. These exceptions are in the vicinity of the Uptown and Ritz theaters.

The intersections of 6th, 7th, and 8th Streets along Olive should also be provided with non-parking 15 feet from corner signs, from 8:00 a.m. to 5:30 p.m., Monday through Friday. These corners are in the vicinity of the Rolla shoe factory.

Parking Meters

There has been a considerable amount of controversy considering the merits or demerits of the parking meters installed along Pine Street and side streets adjacent thereto, and a survey of this type would not be complete without making a few comments on this subject.

Considering this question from the city administration point of view, it can be stated that the meters were the outcome of a considerable amount of pressure brought upon that body by a large percentage of city car owners, who found it almost impossible to obtain a parking space during certain

hours and on certain days. In addition to satisfying this condition, the meters provide a substantial and much needed income that can be used toward city improvements.

Abiding to the will of a great number of citizens, the meters were purchased and placed into operation with the average amount of police enforcement that this type of parking must have if it is to be a success. Consequently, numerous violators have been brought before the bar of justice and compelled to pay mediocre fines.

The cry now can be heard throughout the city that the meters are not serving a good purpose, these cries coming, no doubt, from a large percentage of those who were responsible for their being placed into operation in the first place.

From the viewpoint of the average business man it has been stated that the parking meters are driving away a substantial amount of out-of-town trade, particularly from St. James and Newburg, as the people from these communities do not like the idea of coming into Rolla for the purpose of shopping and taking the chance of parking overtime and consequently receiving violation tickets. This I am very much inclined to doubt as the average out-of-town visitor is anxious to find adequate parking facilities in Rolla and pay a nominal price for this privilege. If he takes undue advantage of the Rolla parking meters and receives a violation ticket, he should not feel any different nor reluctant to pay the penalty than if it were any other law violation.

There is not definite proof, but it is my belief that the foregoing argument presented by a number of local business men is a creation of their own caused, no doubt, by the inconvenience of being compelled to renew the time on the meters every one or two hours throughout the day or, not doing so, receiving parking violation tickets.

I believe the parking meters are here to stay as they do serve a useful purpose. Further, the local traffic conditions are much healthier today in Rolla than they were before the meters were put into operation.

Perhaps the main fault lies with the average driver himself. I believe the average vehicle owner is becoming so accustomed to driving his car to every point where he has business to attend to, no matter how close his destination may be, that he is slowly but surely forgetting how to walk. Rolla has not expanded as yet to such an extent that a great deal of business could not be transacted by using ones own leg power and leaving the automobile in the garage occasionally. If this were done, the parking situation throughout the business district would be normal and adequate.

In conclusion it can be stated that the traffic ills that exist in Rolla cannot be corrected overnight. An intelligent and sound program must be developed and carried through over a long period of time. This program should be developed by an appointed planning commission.

supervised by the City Engineer. An overall master plan should be devised and stages of improvement should be carried out in accordance with the financial condition of the city and as rapidly as the enactment of city ordinances will allow. If Rolla is to have practical and sound traffic coordination thirty years in the future, positive action must be taken now.

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

6TH & PINE STREETS

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

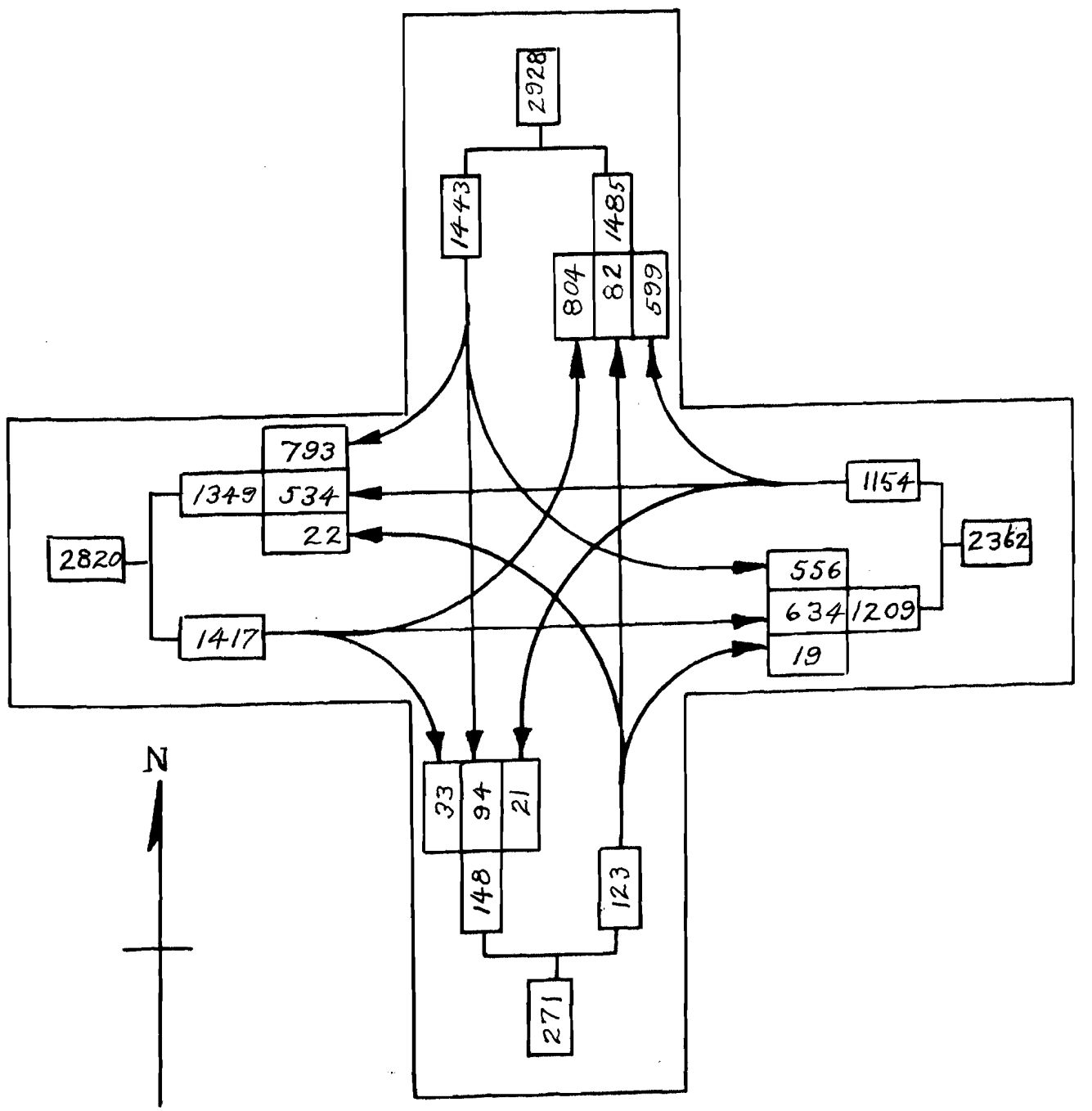


Fig. 16

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

7TH & PINE STREETS

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

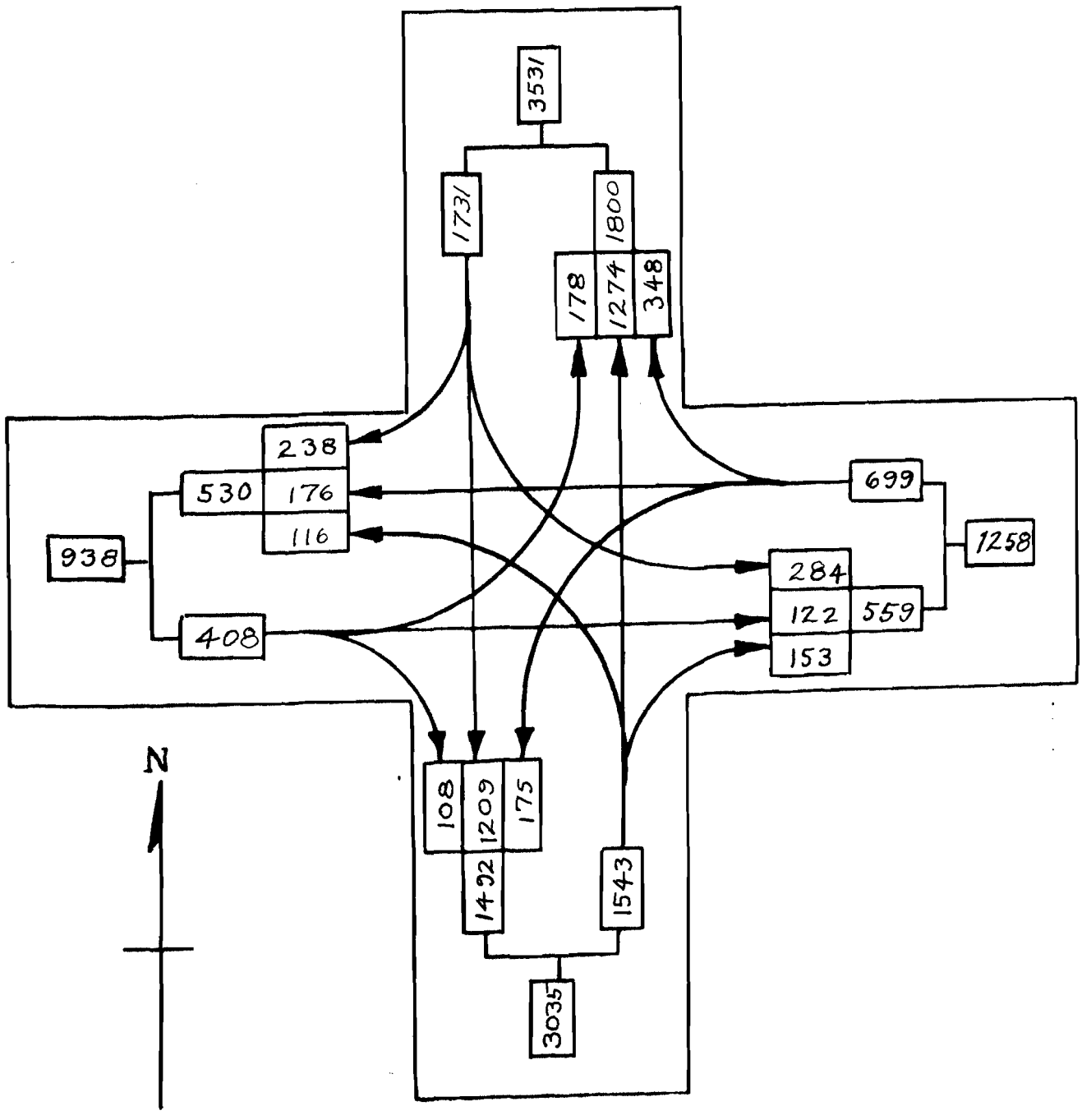


Fig 17

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

8TH & PINE STREETS

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

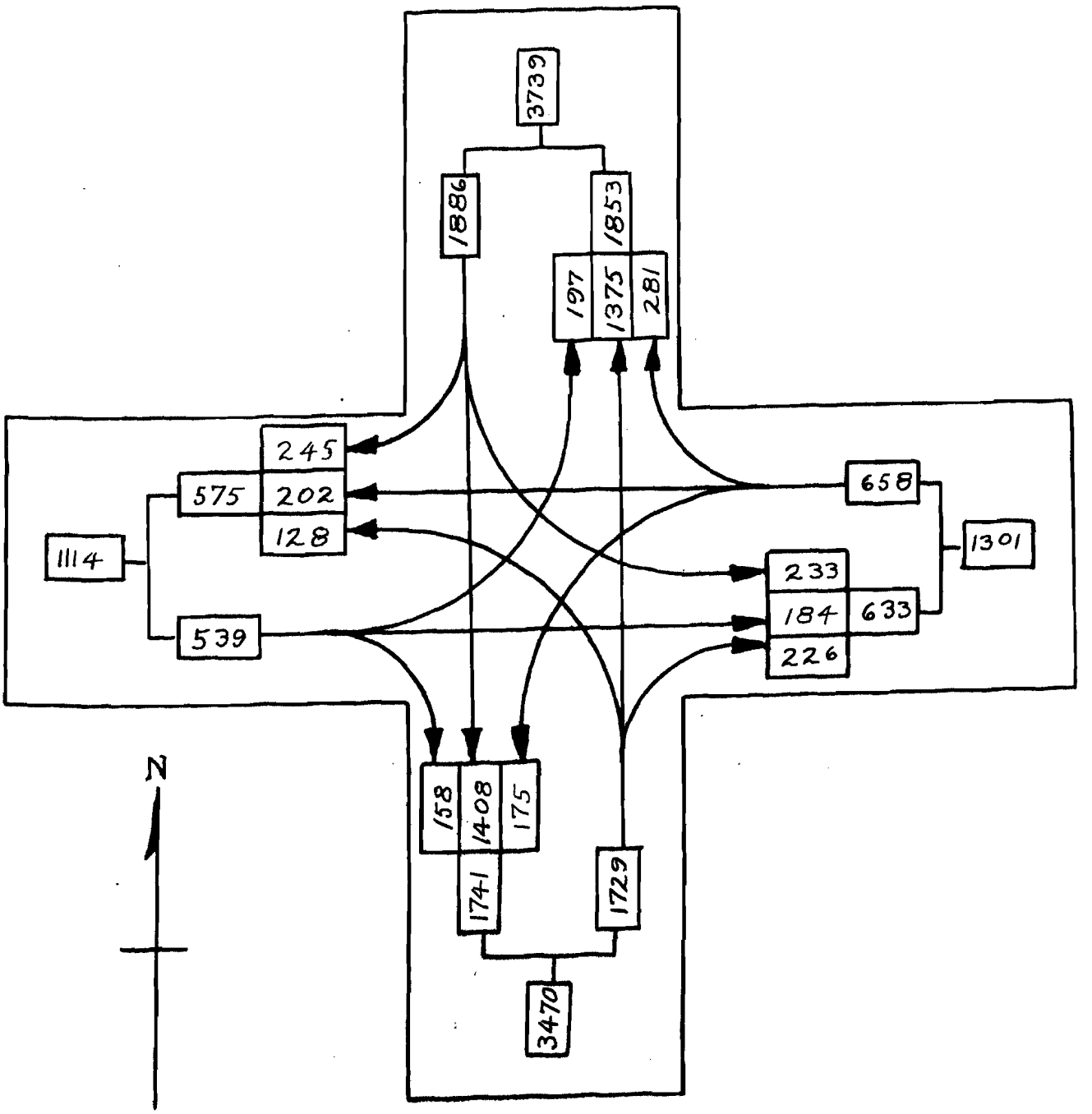


Fig. 18

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

9TH & PINE STREETS

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

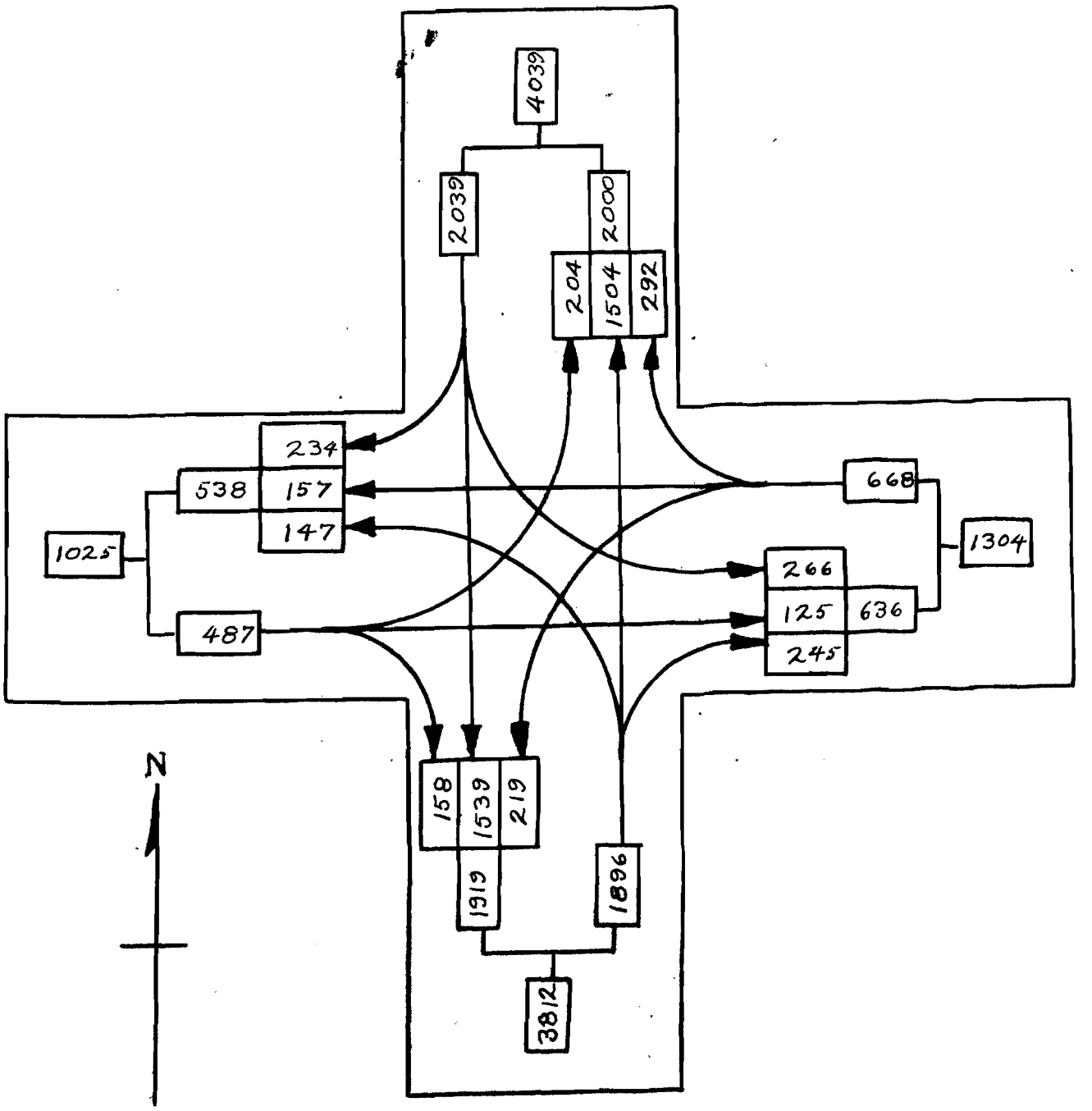


Fig. 19

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

10TH & PINE STREETS

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

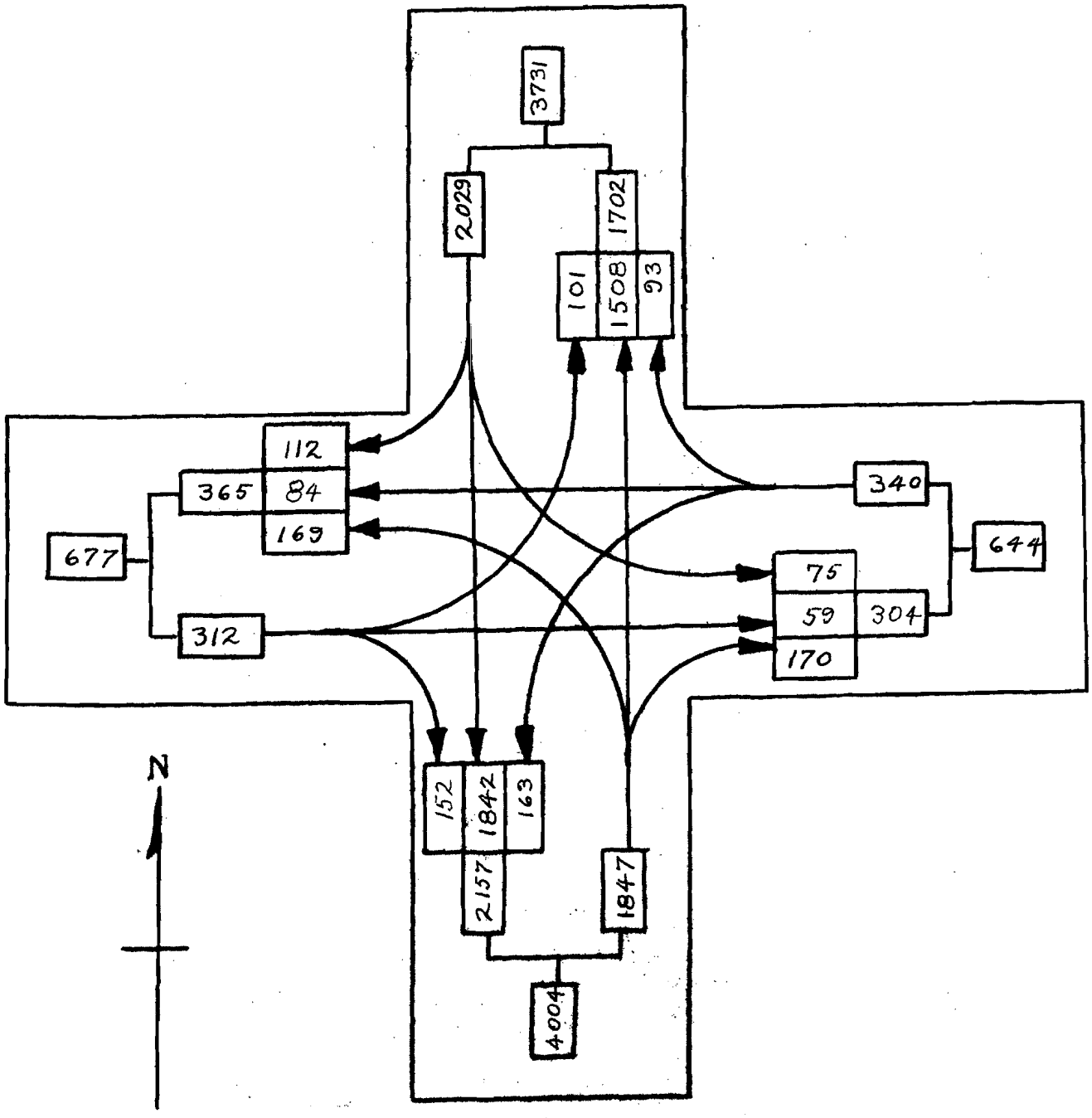


Fig. 20

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

11TH & PINE STREETS

DAILY AVERAGE

YPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

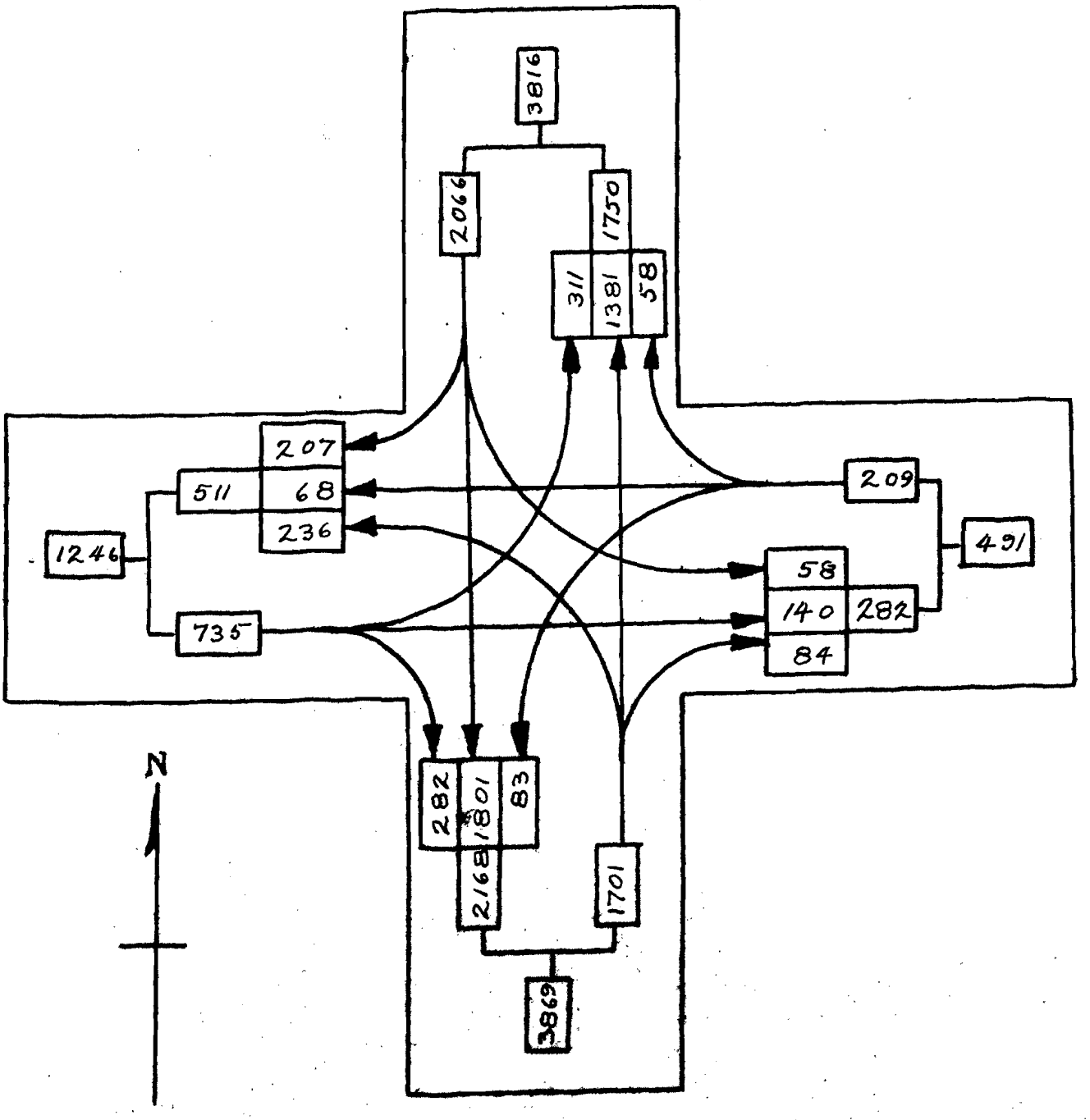


Fig. 21

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

12TH & PINE STREETS

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

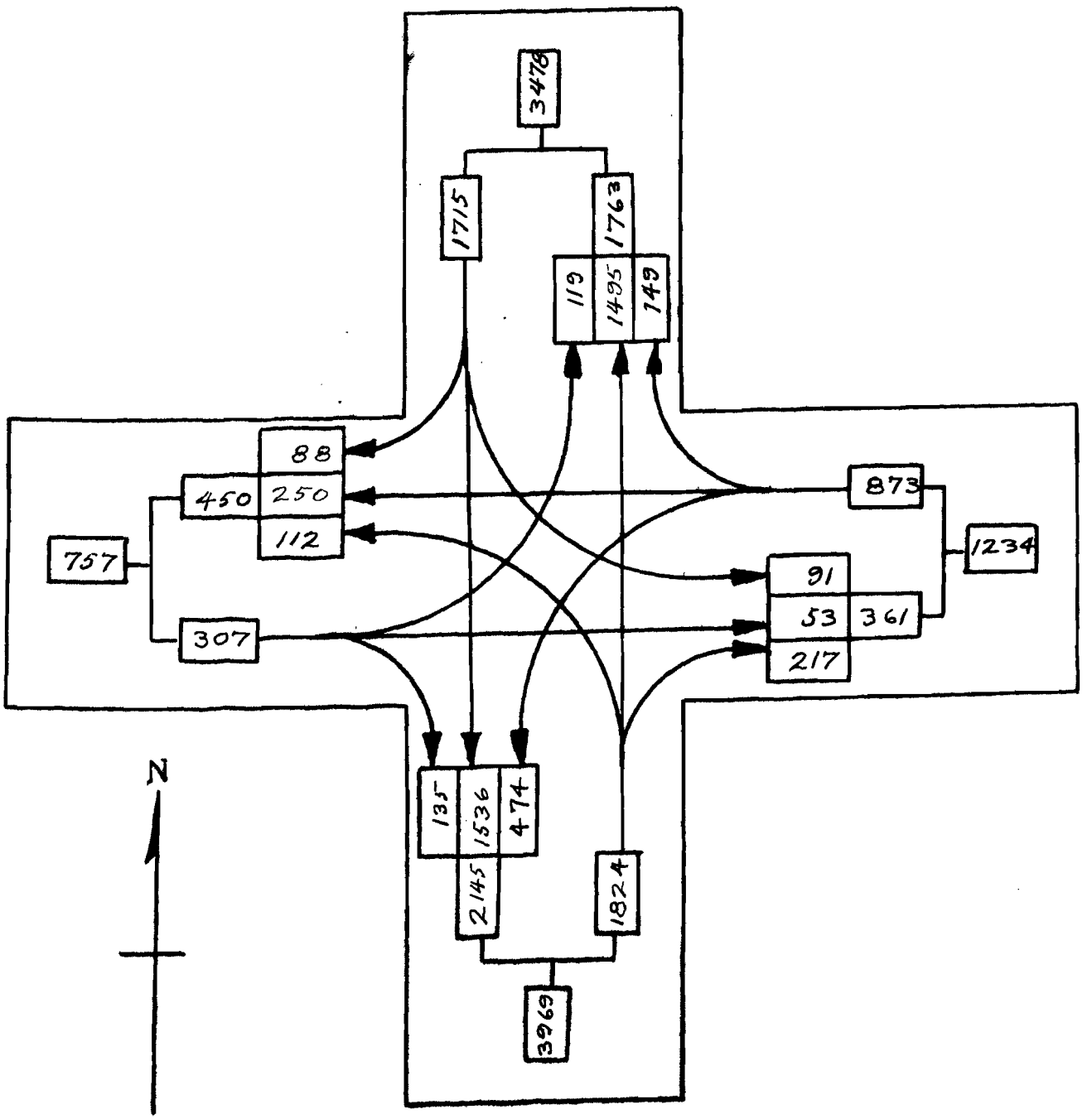


Fig. 22

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

14TH & PINE STREETS

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

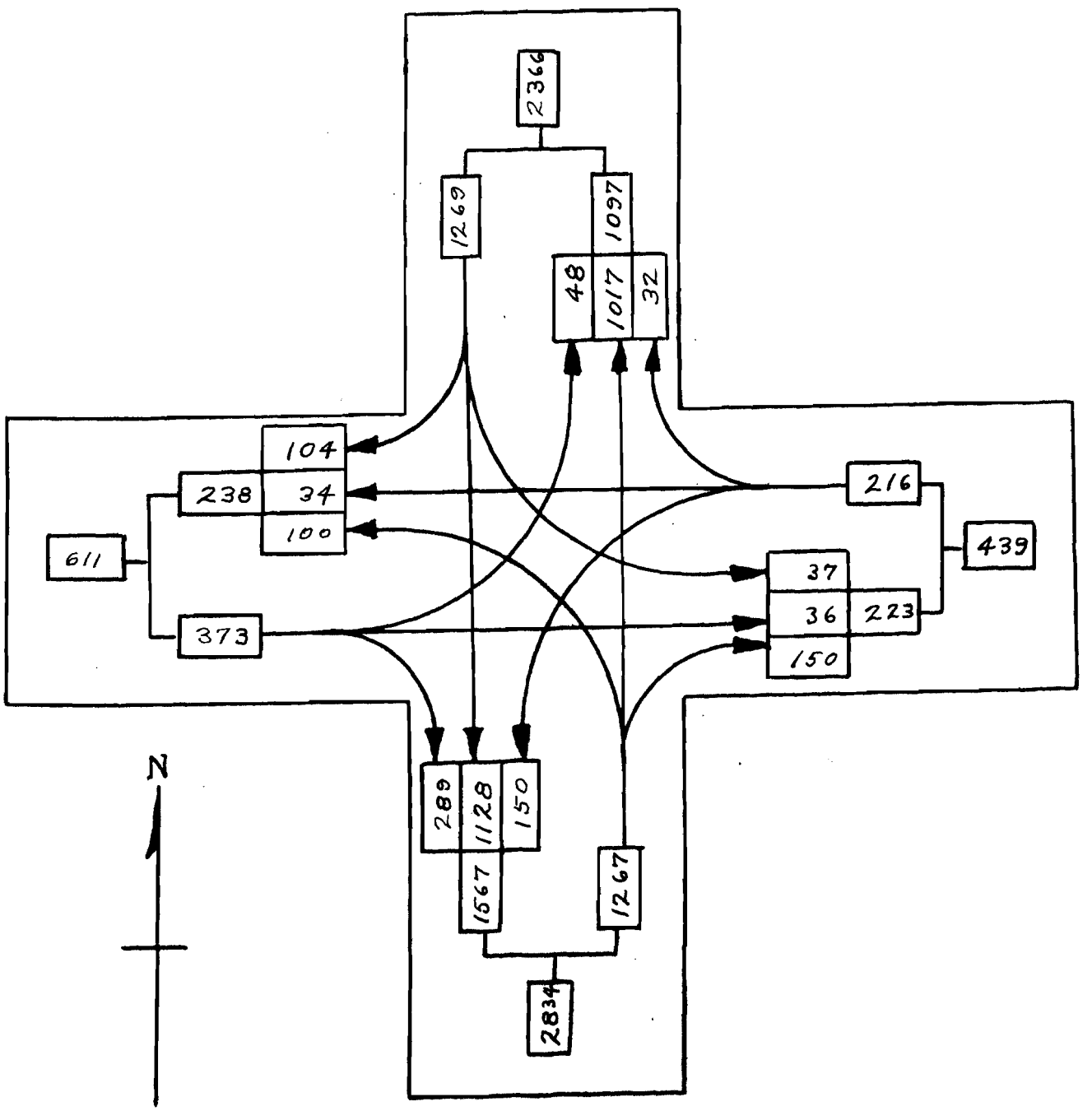


Fig. 23

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

U.S. 66 & U.S. 63 (STA. NO. 1)

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

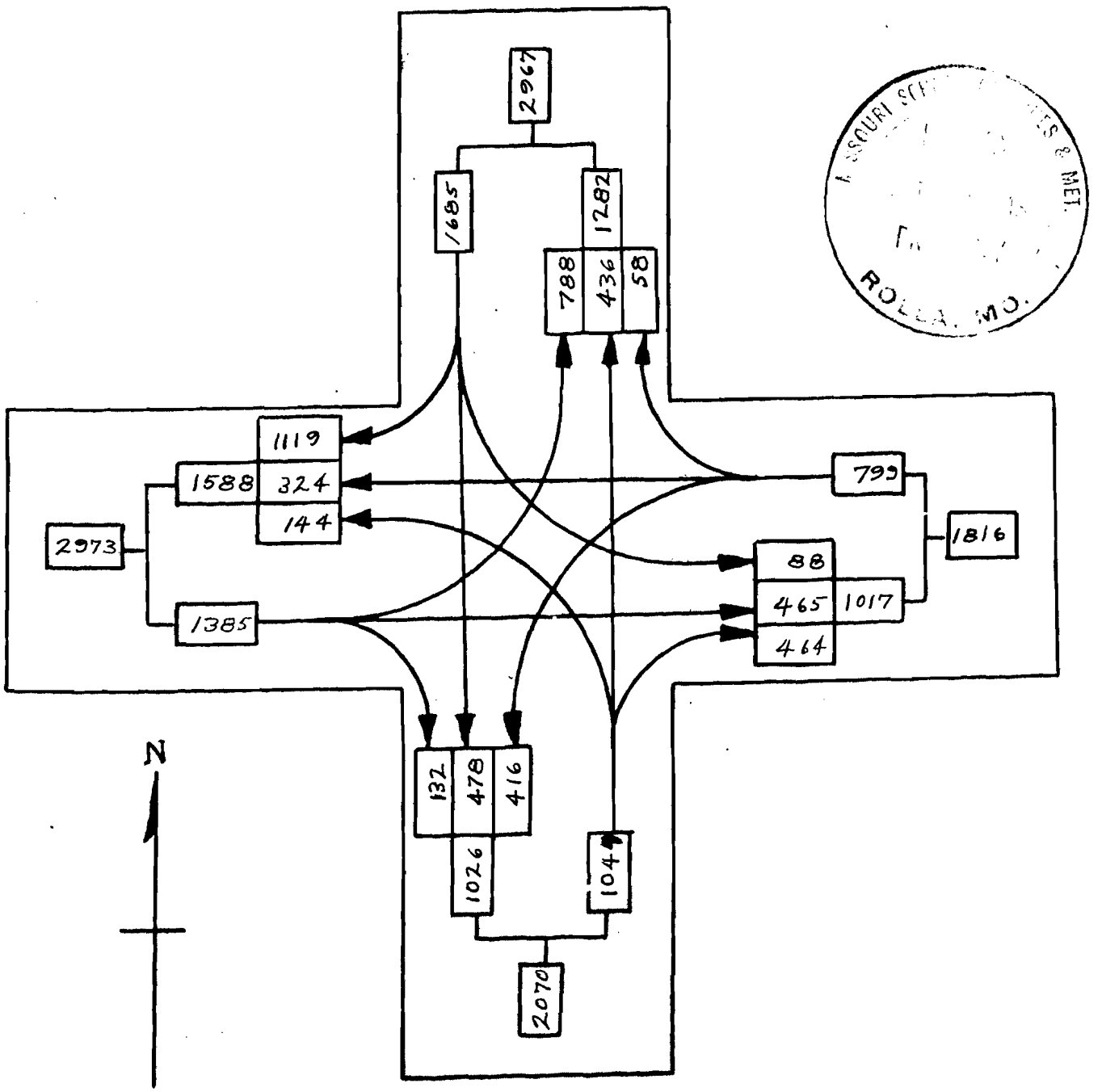


Fig. 24

71544

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

U.S. 66 & 14TH STREET (STA. NO. 2)

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

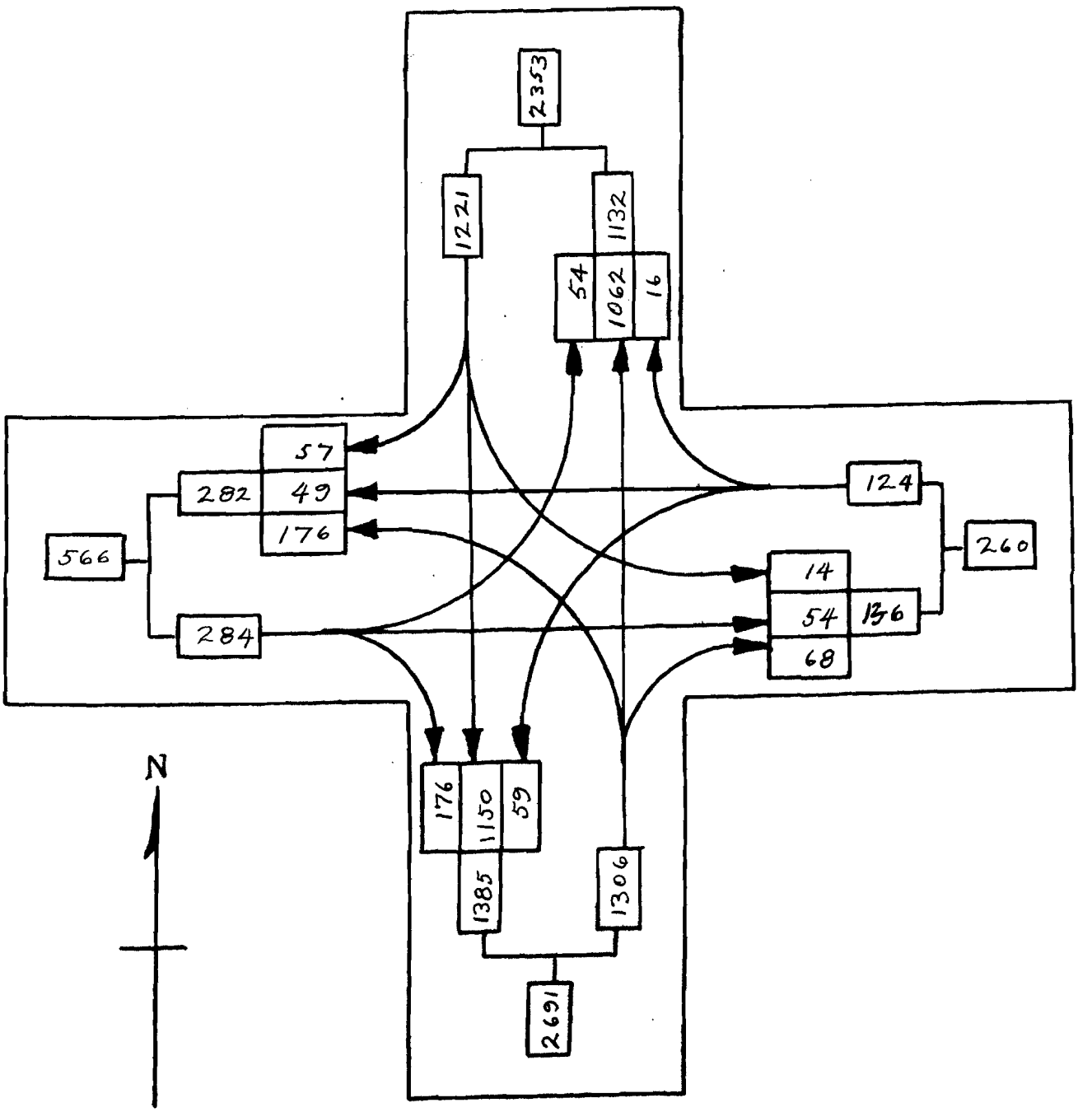


Fig. 25

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

U.S. 66 & VICHY ROAD (STA. NO. 3)

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

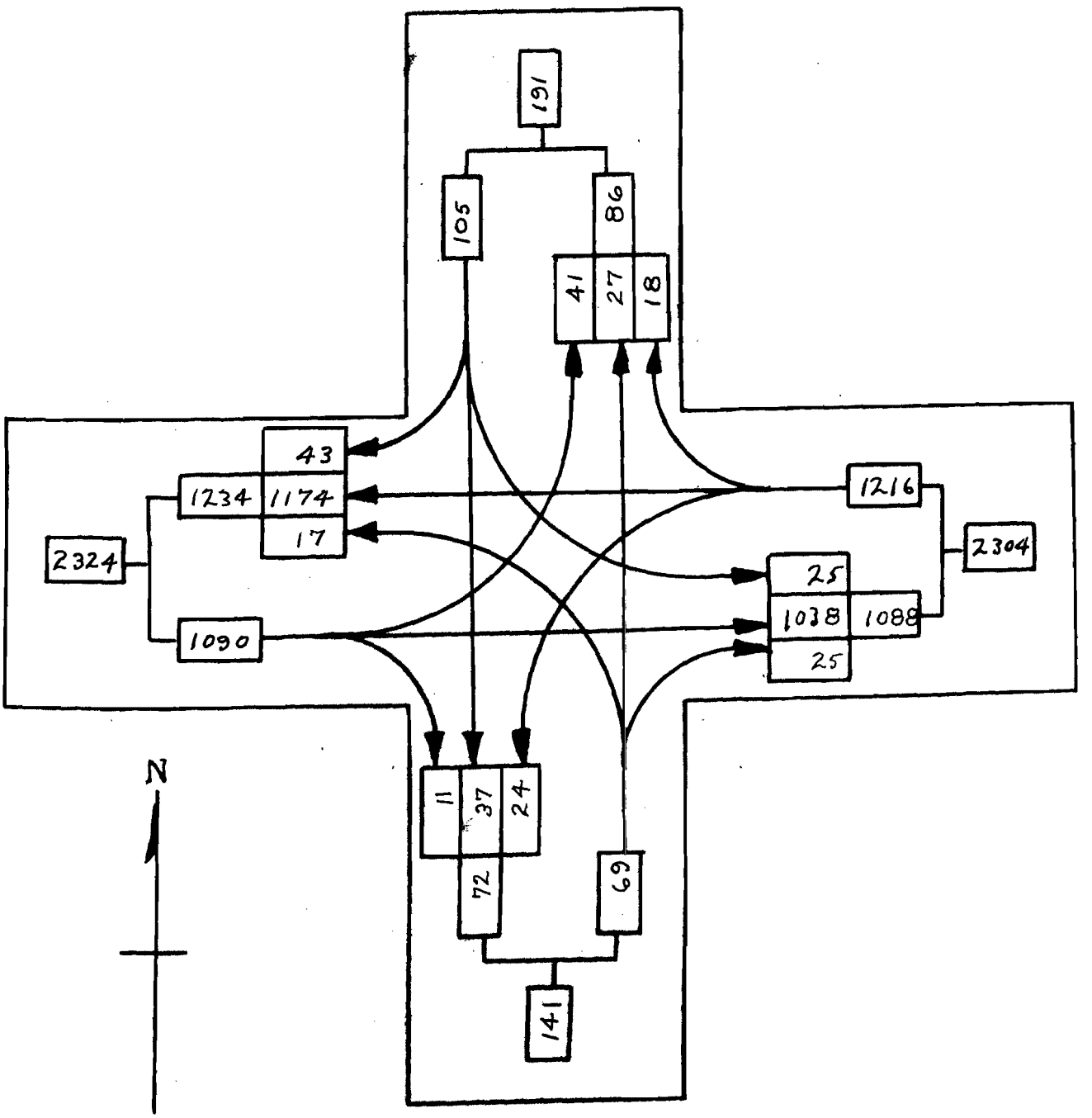


Fig. 26

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

U.S. 66 & NORTH PINE STREET (STA. NO. 4)

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

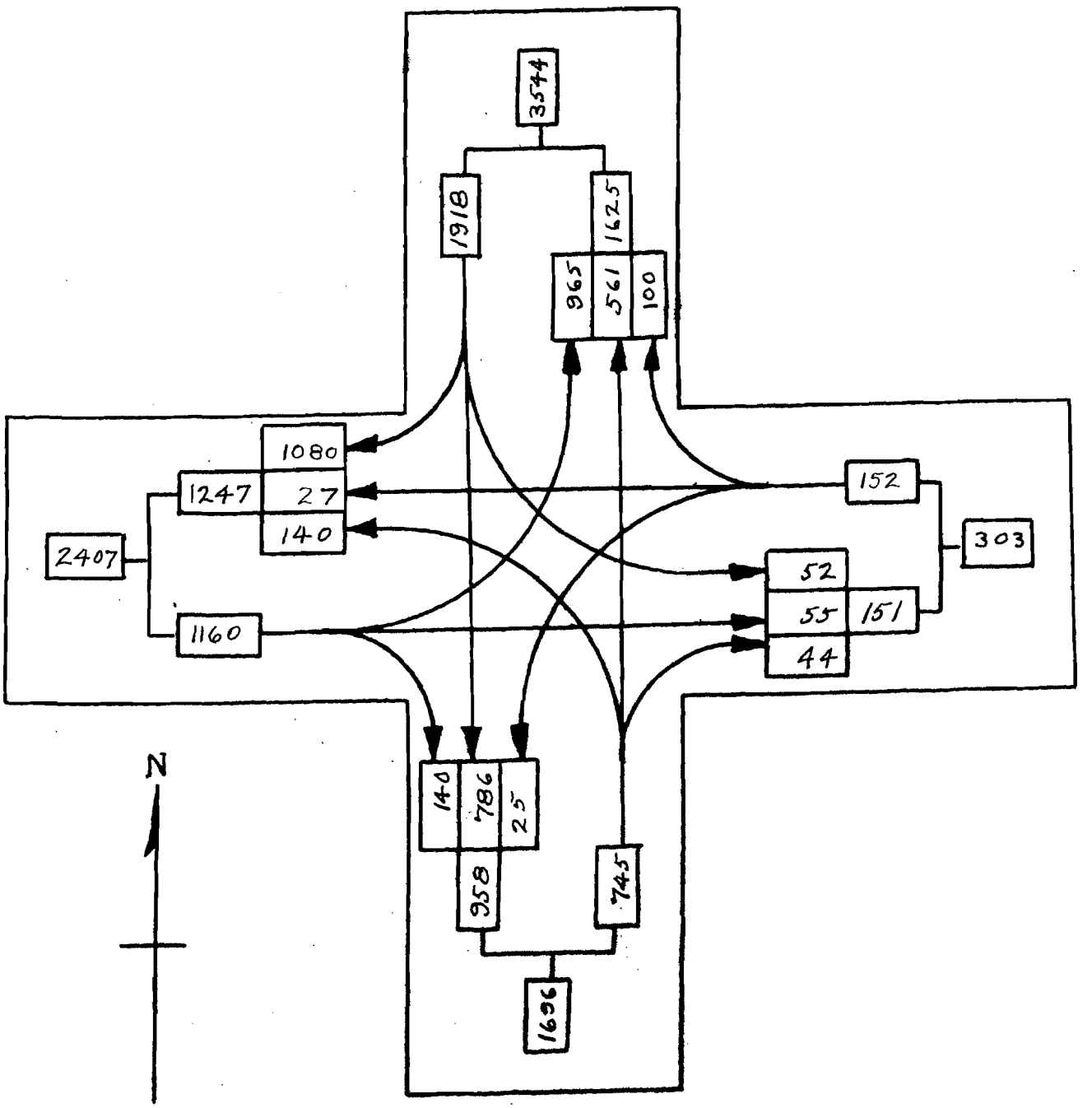


Fig. 27

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

HOLLOWAY & 10TH STREETS (STA. NO. 6)

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

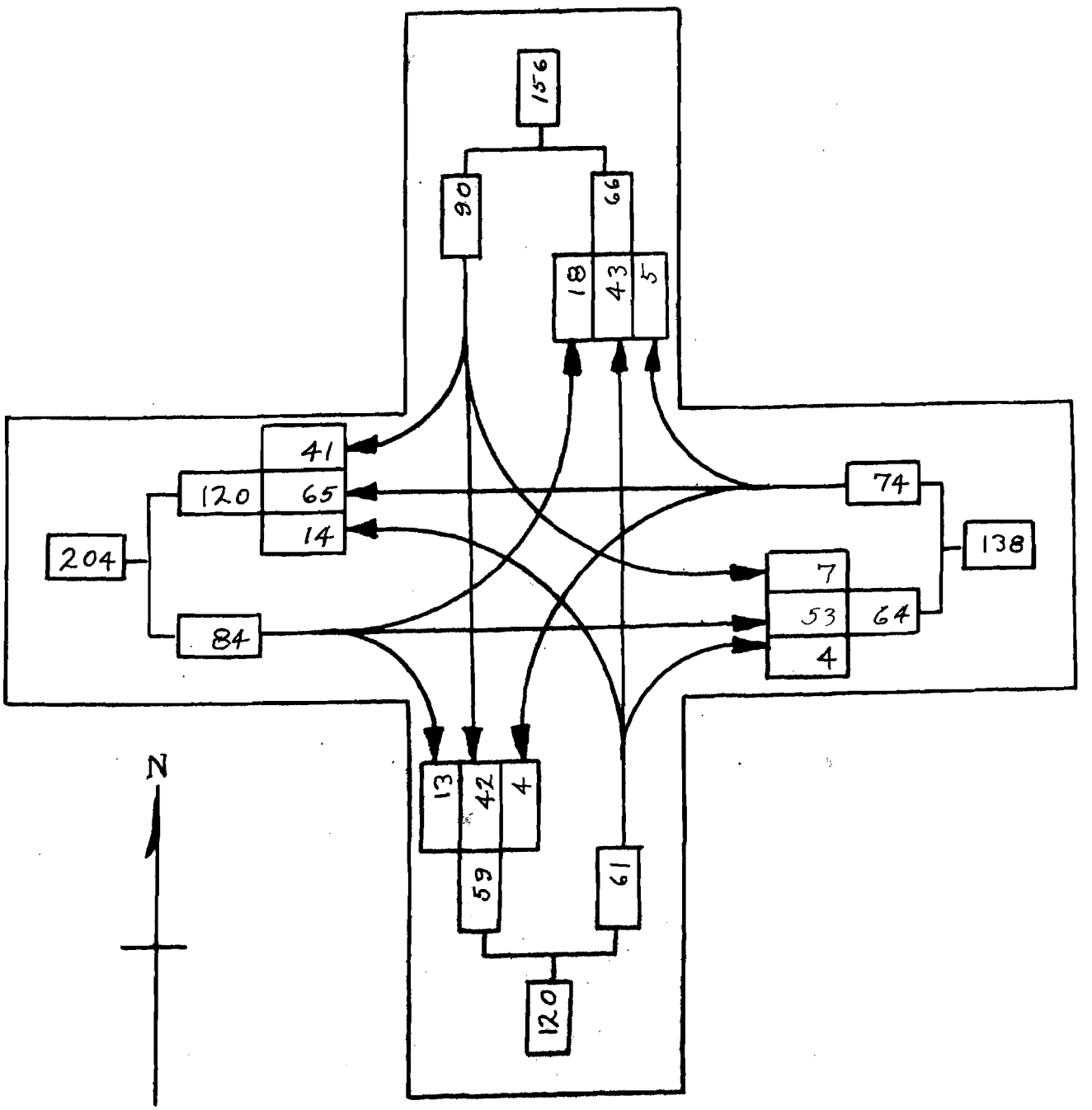


FIG. 28

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

SOEST ROAD & SALEM AVENUE (STA. NO. 7)

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

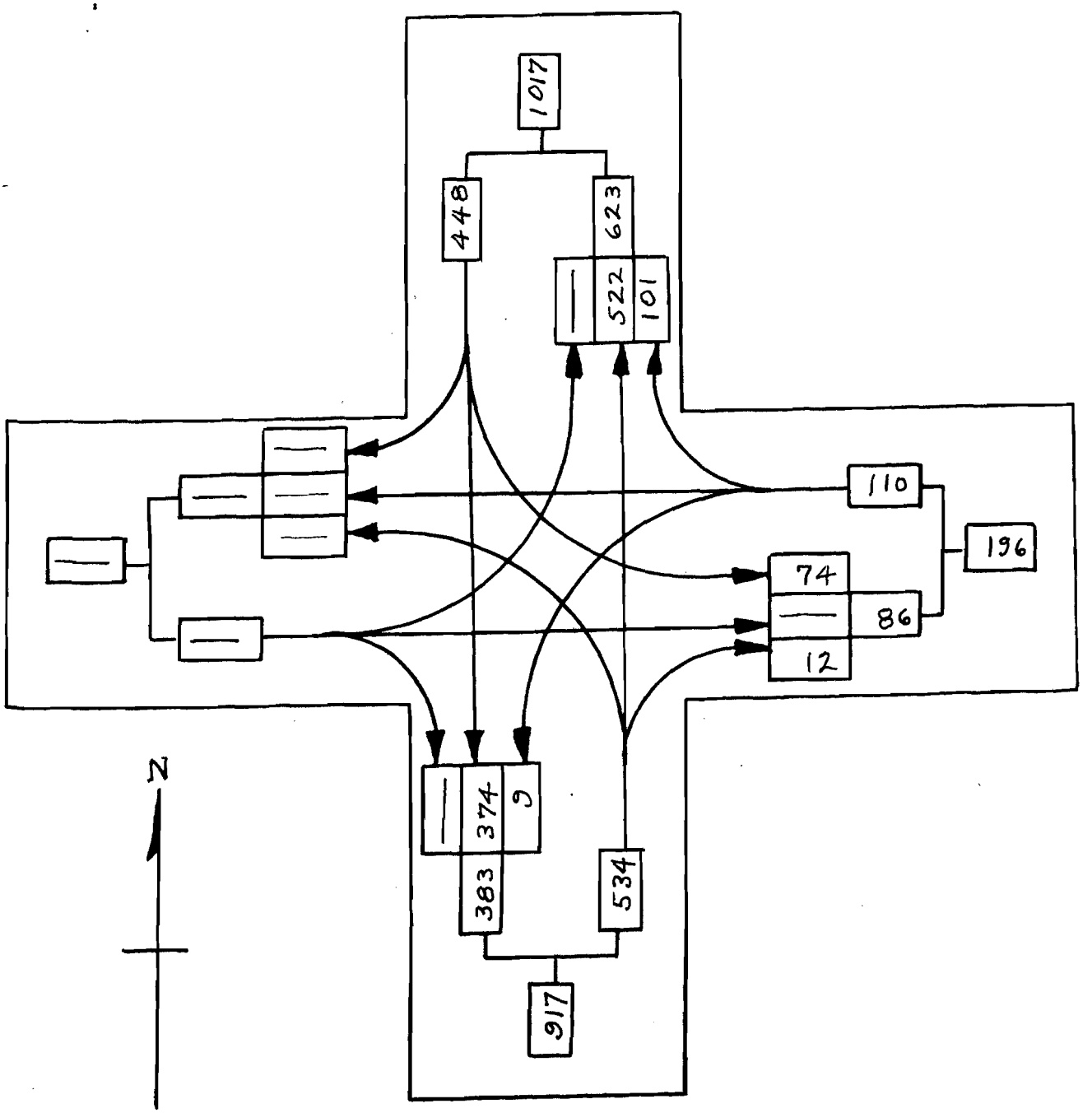


Fig. 29

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

U.S. 72 & SALEM AVE. (STA. NO. 8)

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

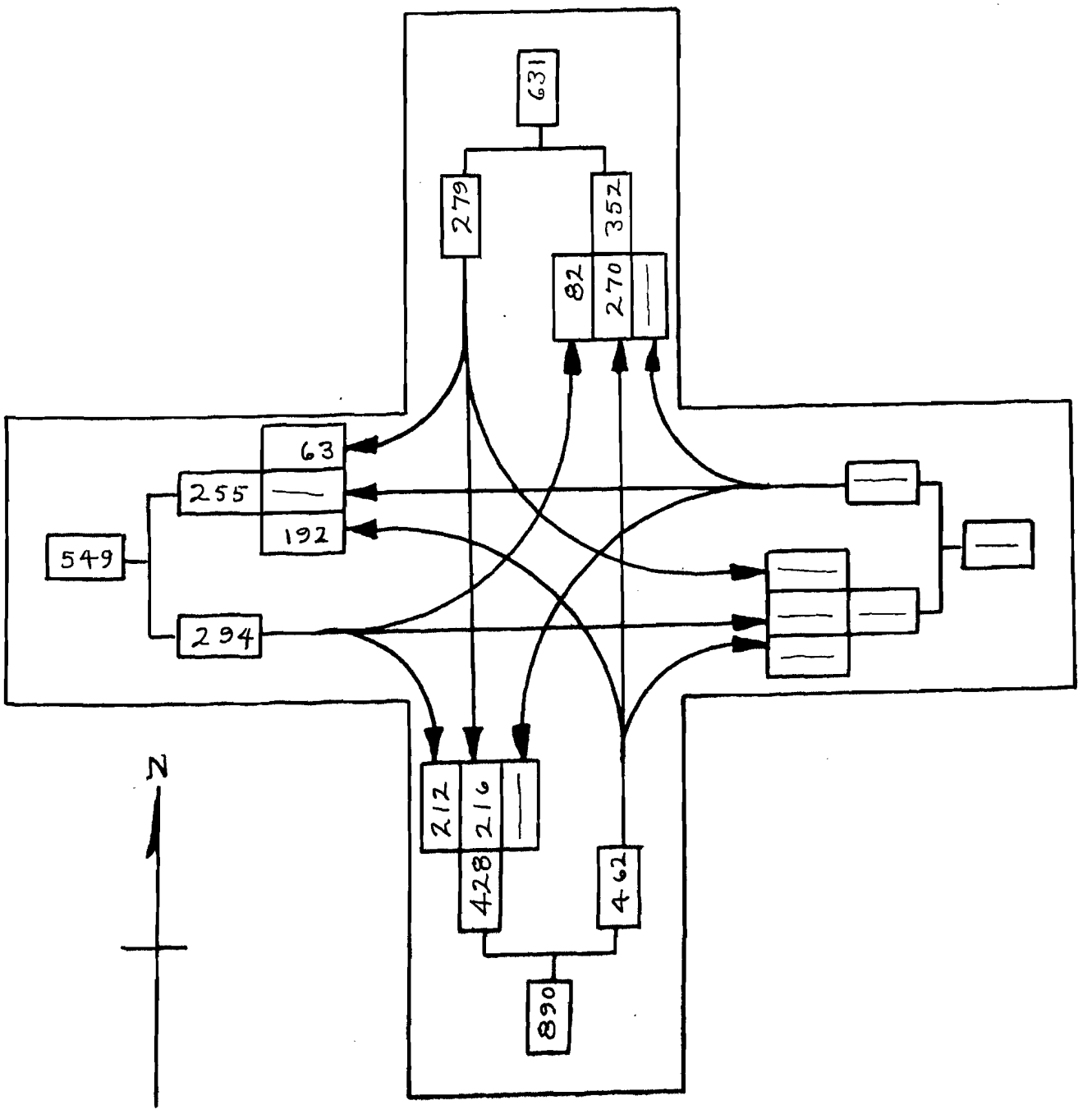


Fig. 30

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

U.S. ROUTE 72 & ROLLA STREET (STA. NO. 9)

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

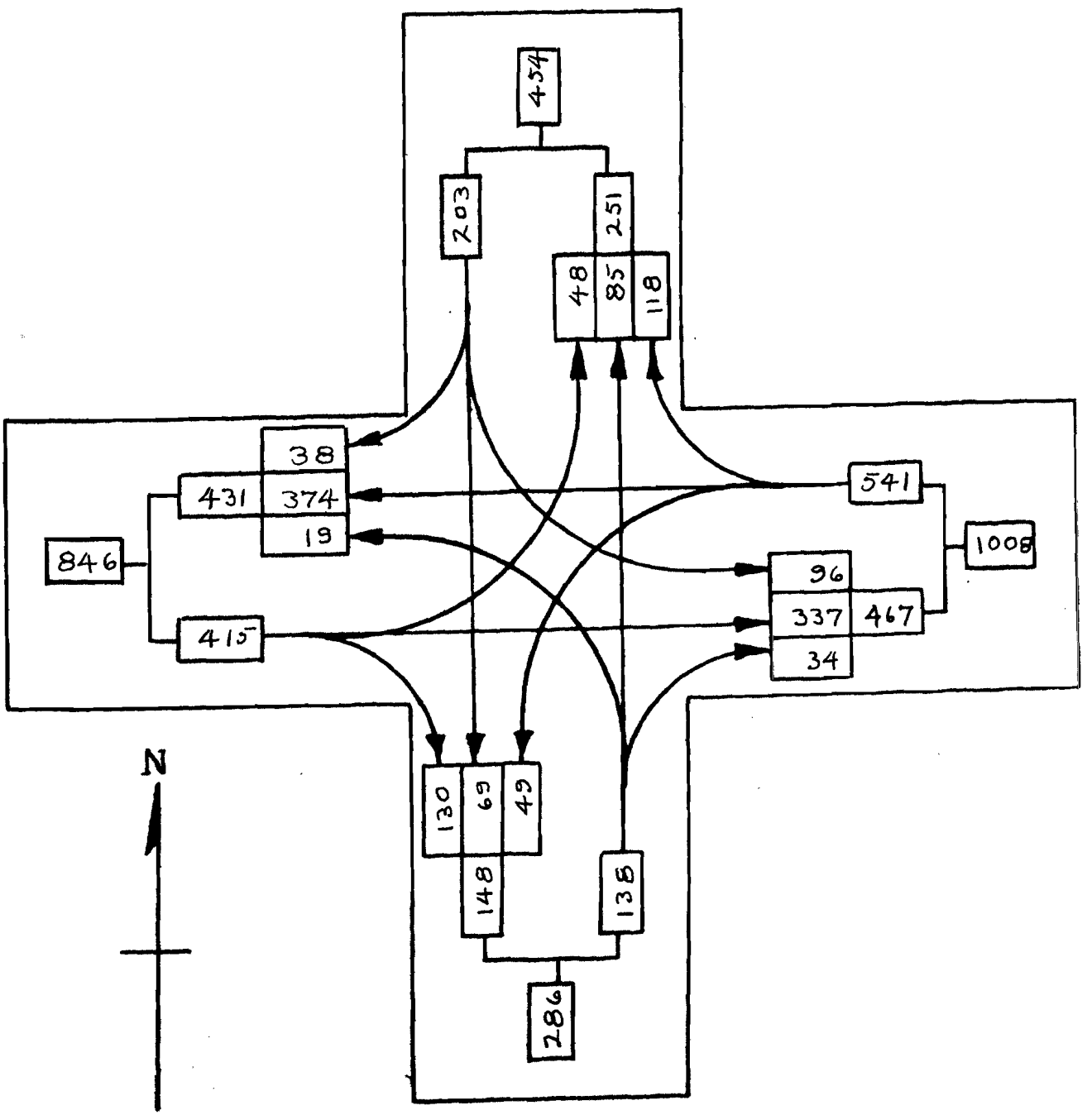


Fig. 31

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

U.S. 63 & U.S. 72 (STA. NO. 10)

DAILY AVERAGE

YPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

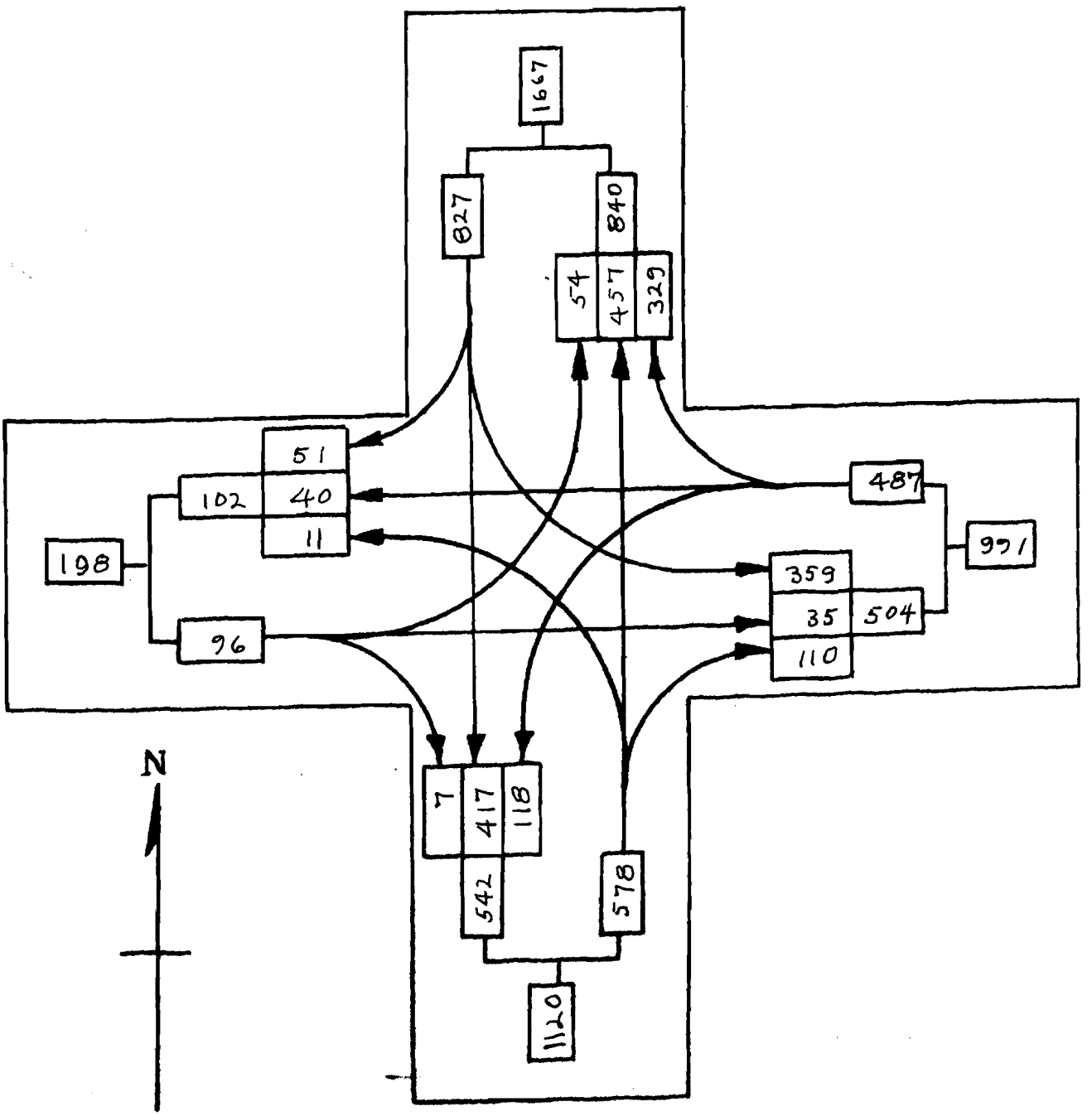


Fig. 32

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

18TH STREET & R.R. X-ING

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 A.M. TO 5:00 P.M.

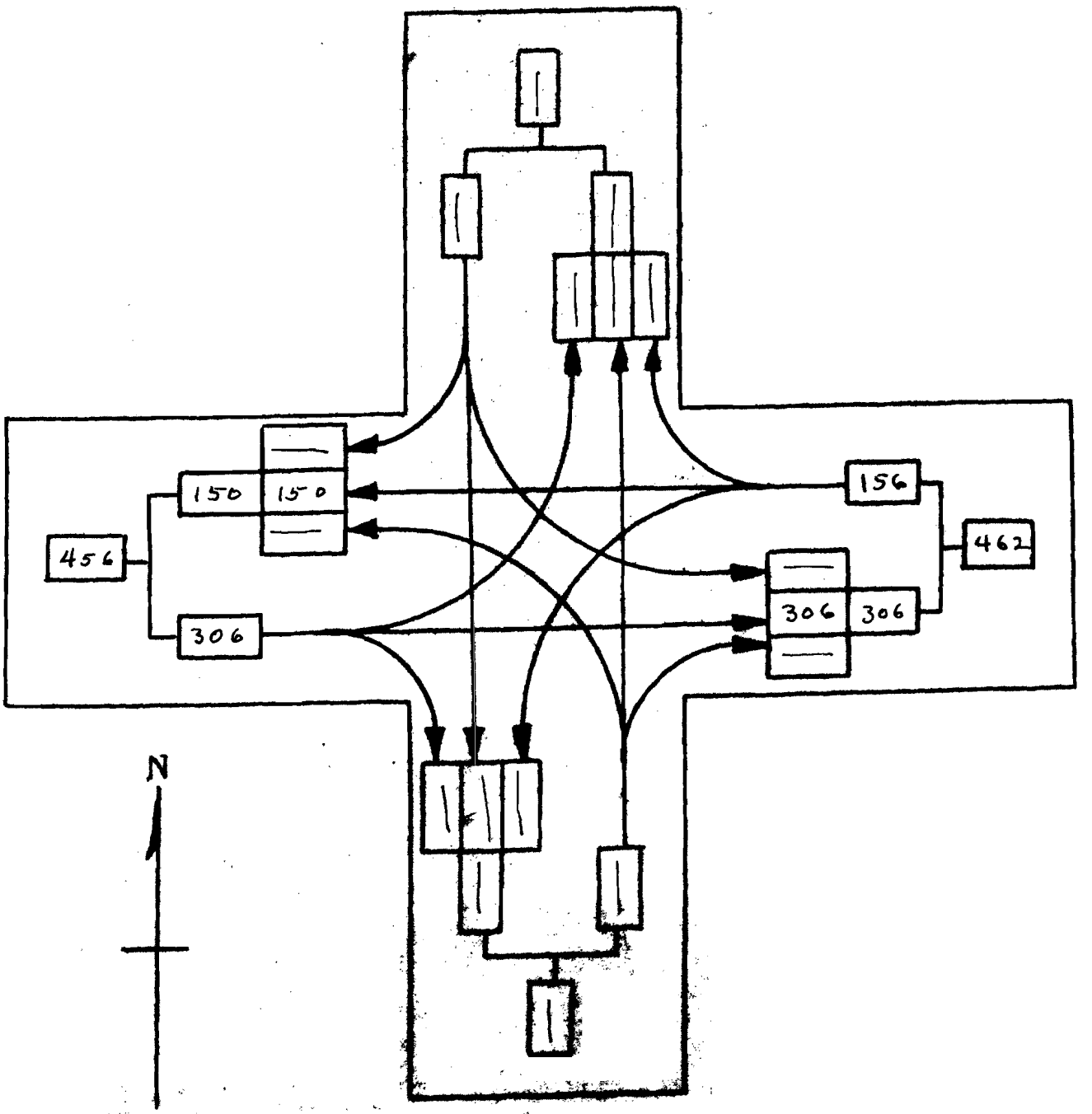


FIG. 33

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

12TH STREET & RR. X-ING

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

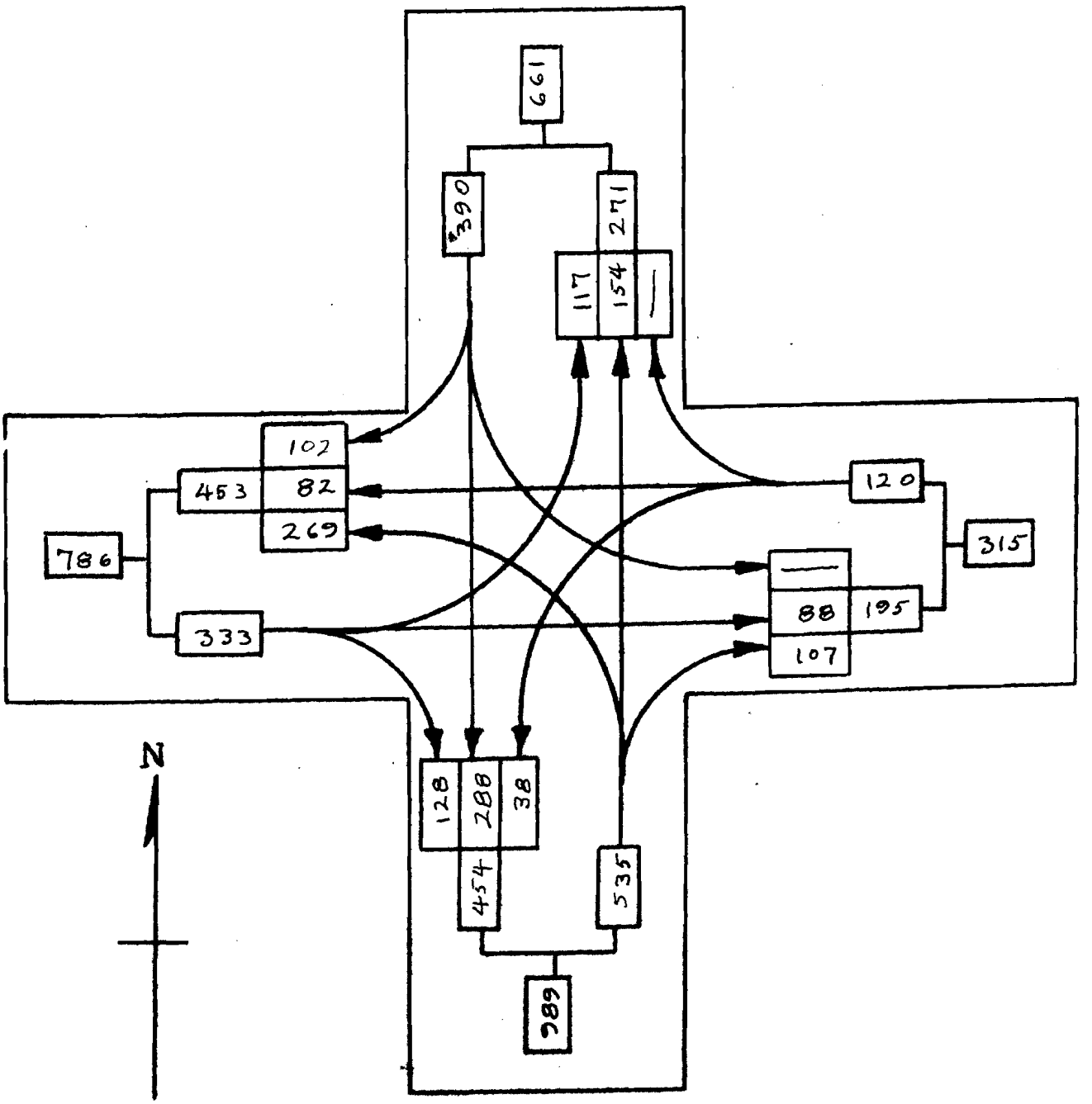


Fig. 34

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

8TH STREET & R.R. X-ING

DAILY AVERAGE

'PE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

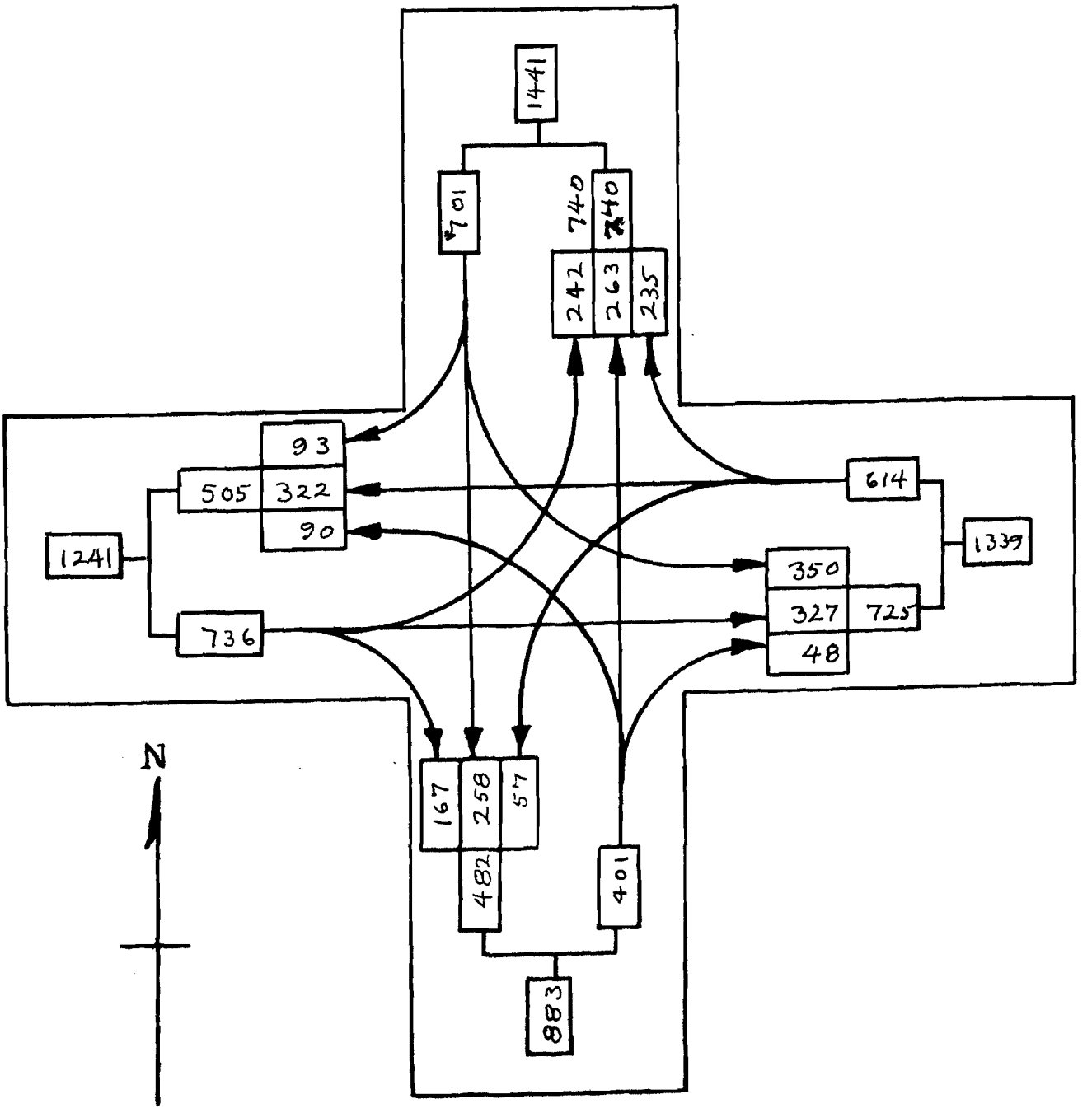


Fig. 35

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

7TH STREET & R.R. X-ING

DAILY AVERAGE

TYPE OF VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

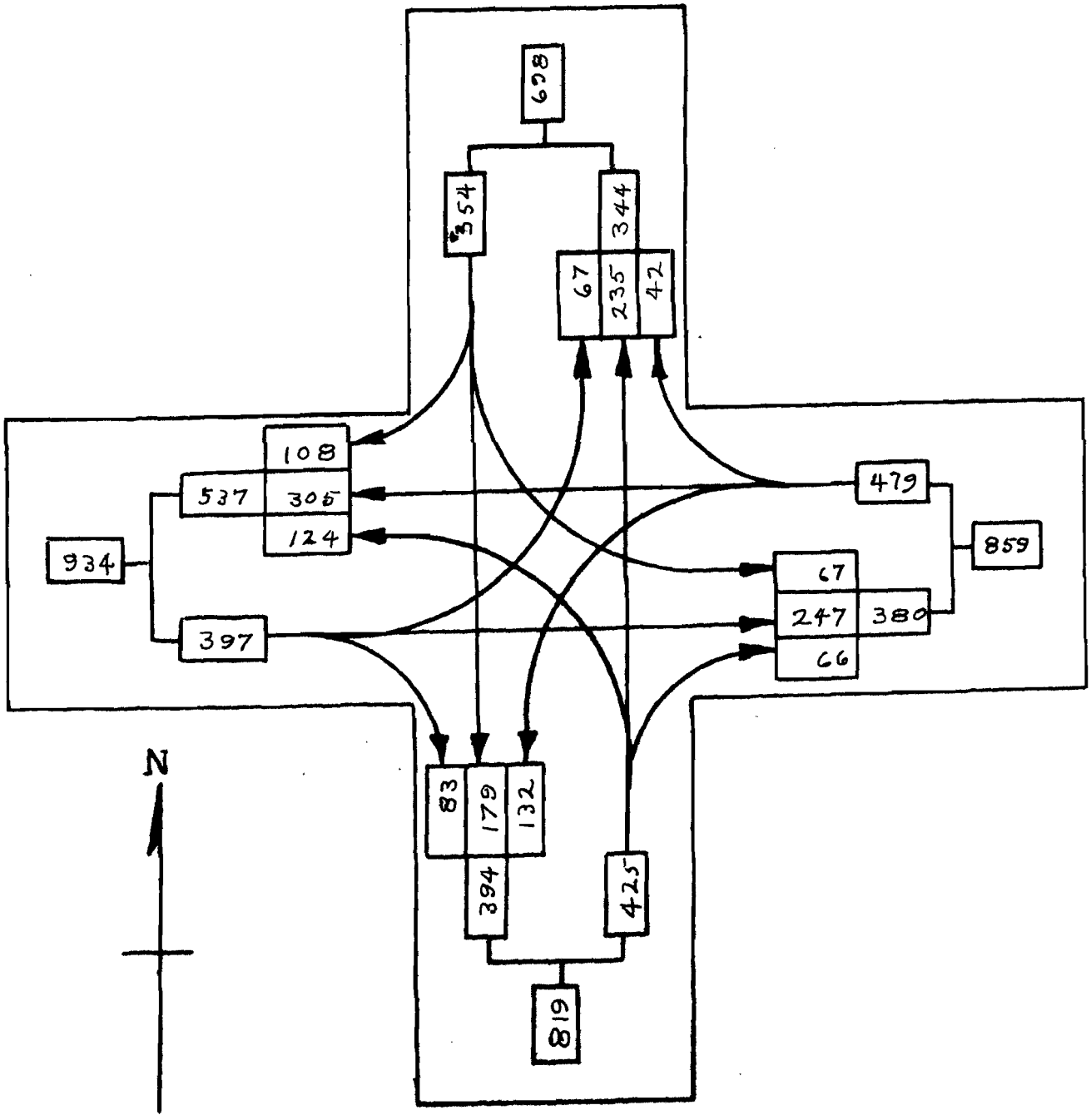


Fig. 36

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

4TH & ROLLA STREETS

DAILY AVERAGE

YPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

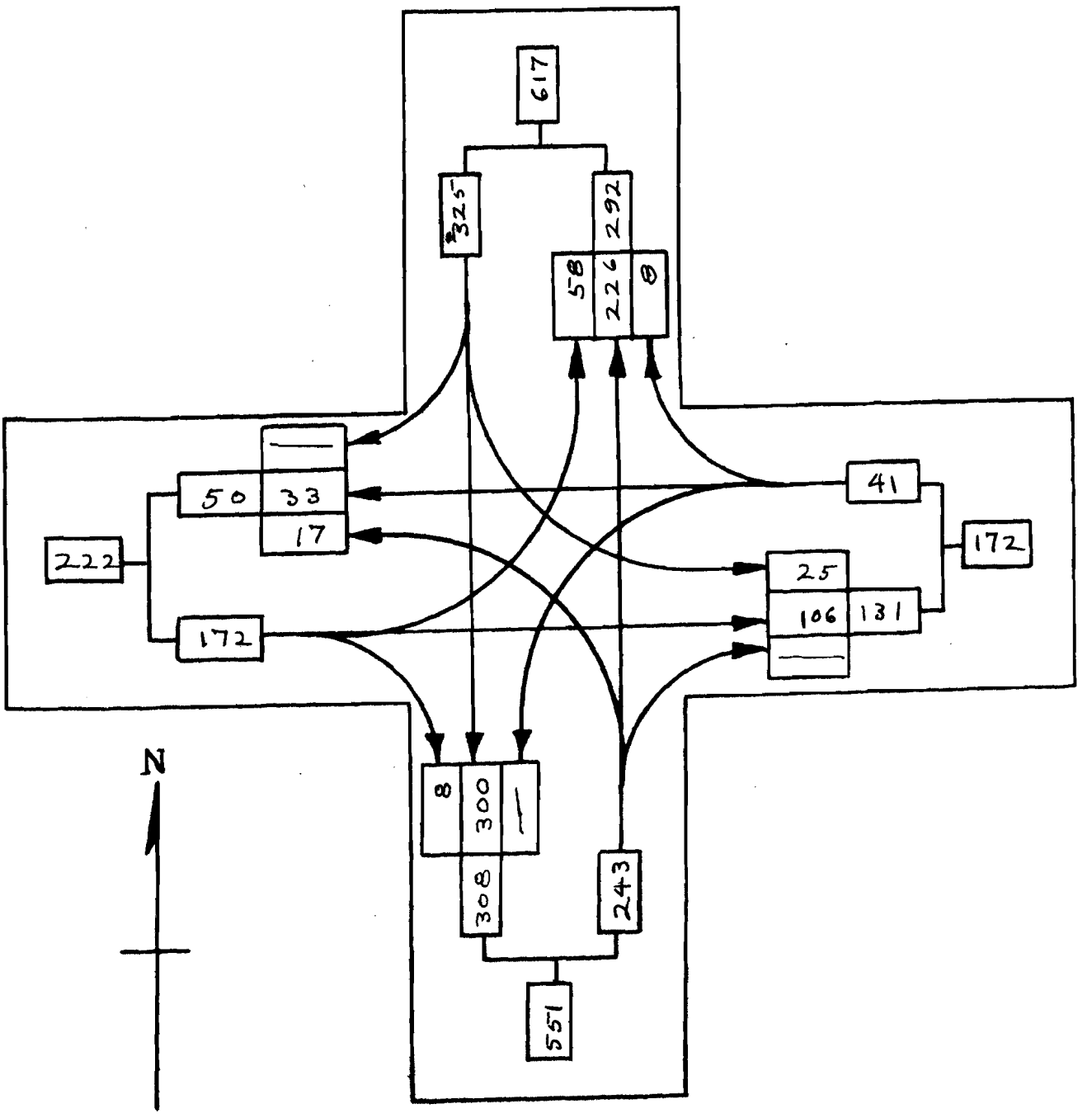


Fig. 37

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

8TH & CEDAR STREETS

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

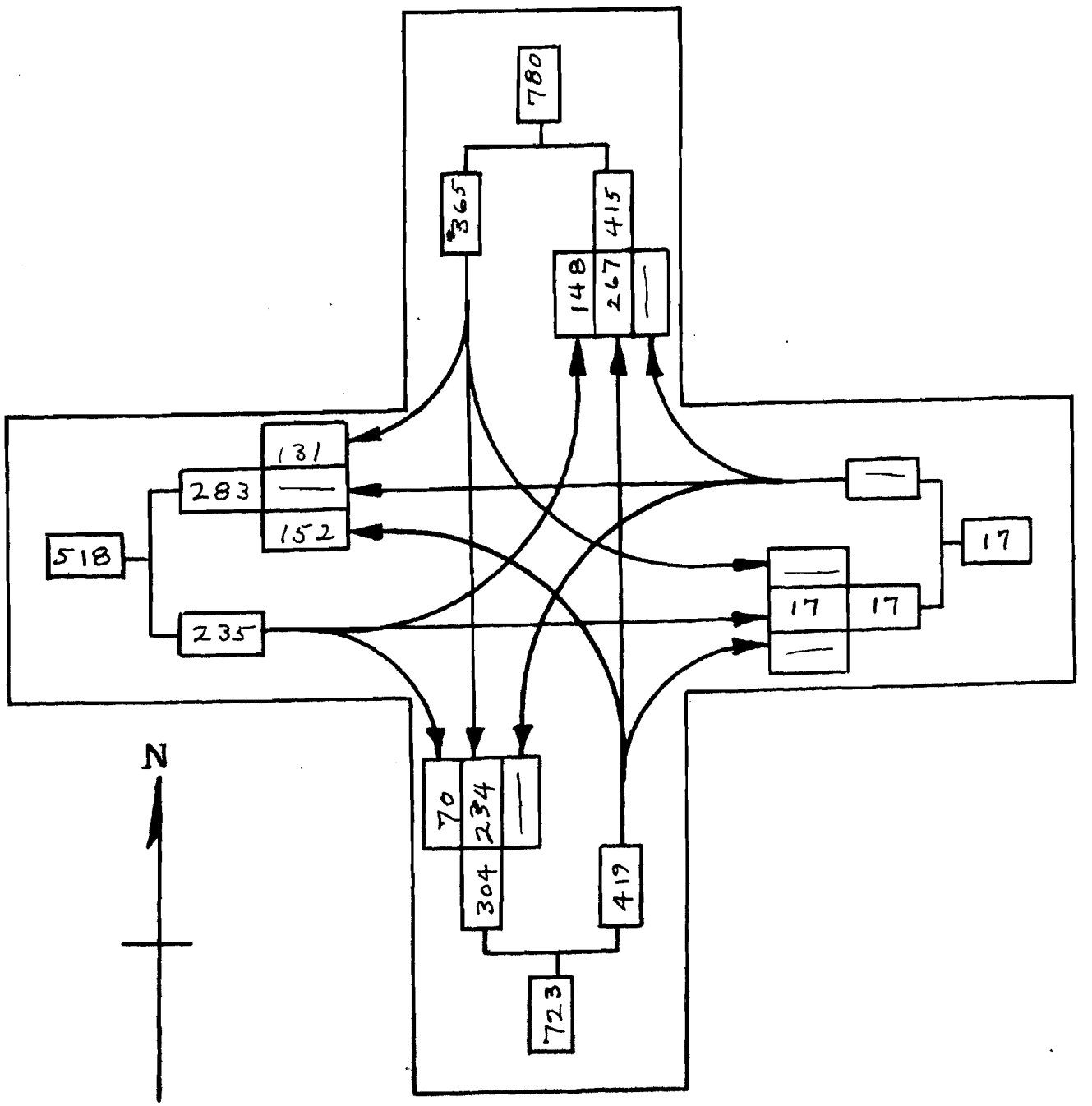


Fig. 38

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

7TH & CEDAR STREETS

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

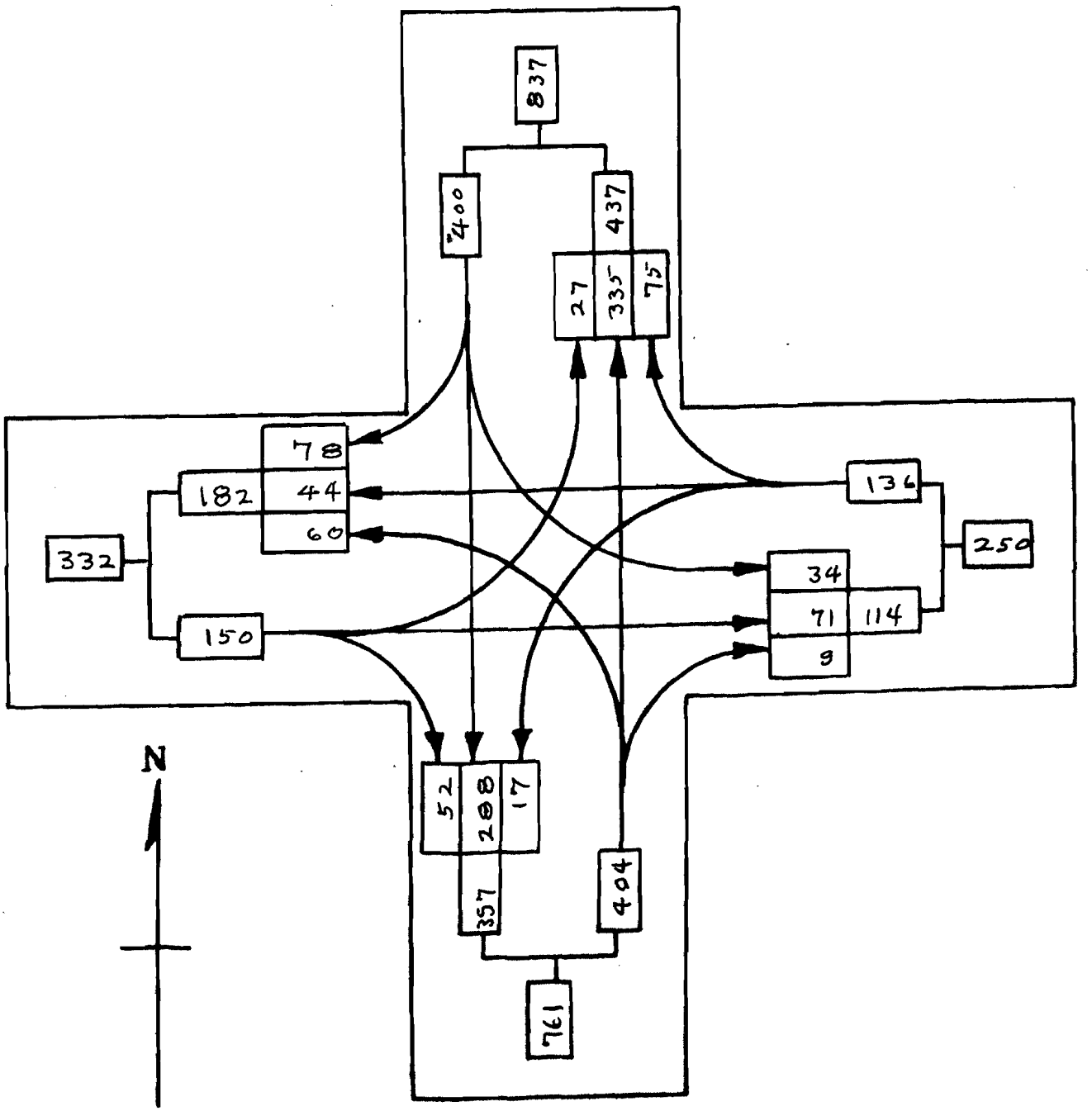


Fig. 39

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF

6th & Cedar Streets

DAILY AVERAGE

TYPE VEHICLES OBSERVED
All Types

PERIOD OF OBSERVATION
7:00 AM. TO 5:00 P.M.

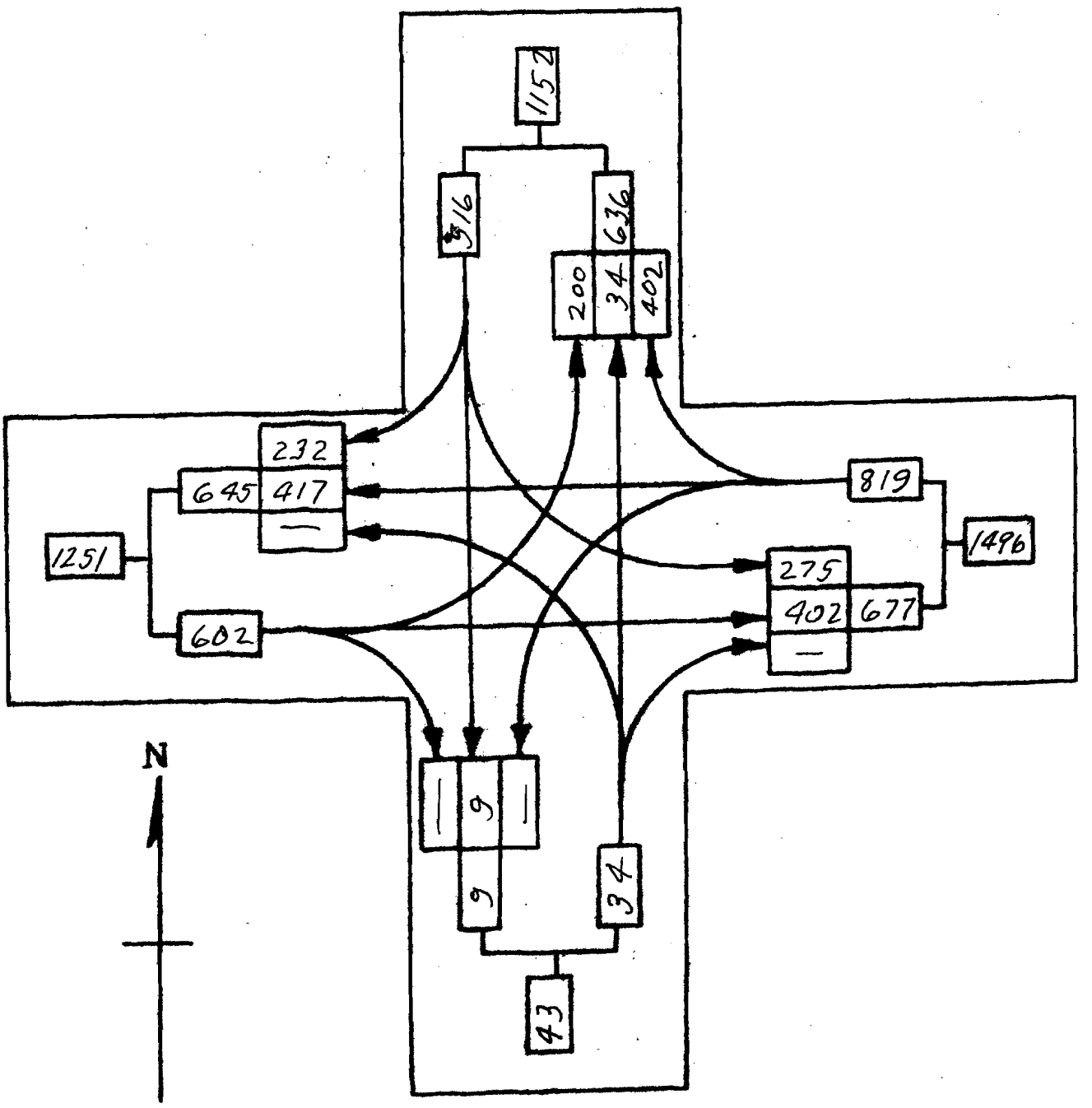


Fig. 40

ROLLA TRAFFIC SURVEY

VEHICULAR TRAFFIC AT THE INTERSECTION OF 9th Street & R.R. R.O.W.

DAILY AVERAGE

TYPES OBSERVED

PERIOD OF OBSERVATION

7 A.M. to 5:00 P.M.

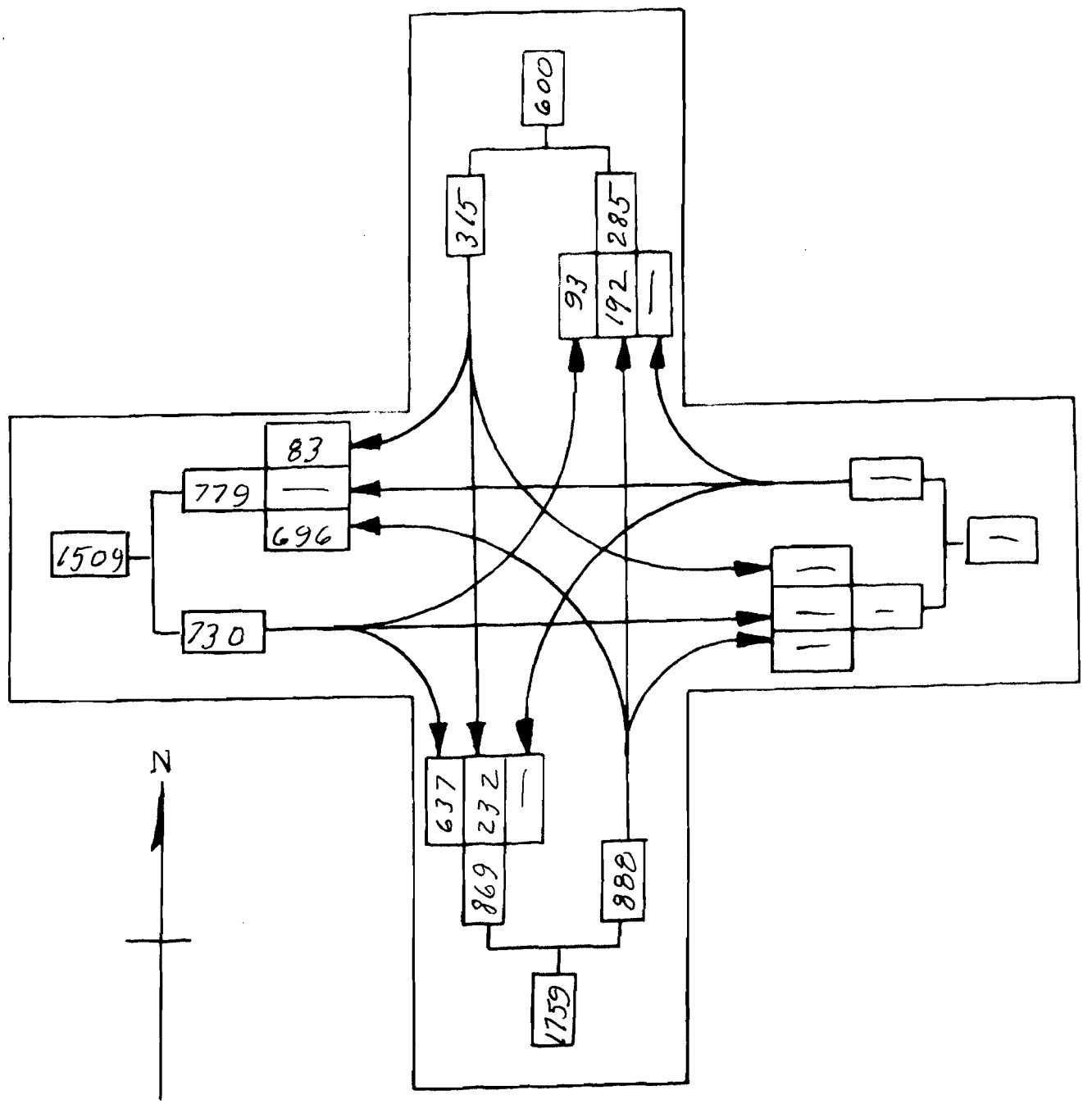


Fig. 41

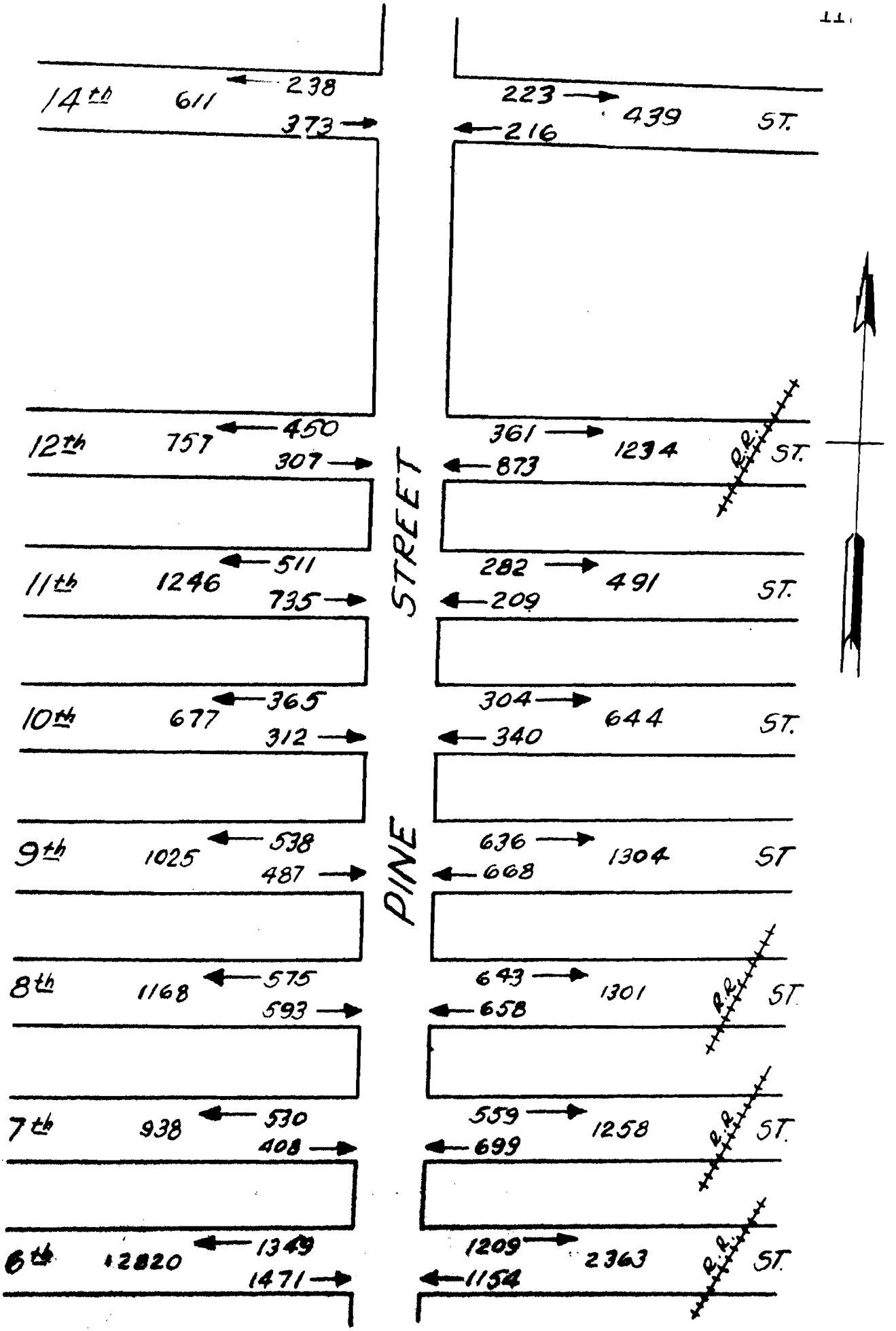


FIG. 42
TRAFFIC ENTERING & LEAVING PINE ST.

RECAPITULATION OF RECOMMENDATIONS

Figure 43 graphically portrays the major vehicular flow throughout the city of Rolla. It is self-evident that Pine Street and U.S. 66 carries the maximum flow of traffic and the improvement of these two thoroughfares is of prime importance.

The following is a recapitulation of recommendations:

PINE STREET

Increase the capacity by one or a combination of the following means:

(a) Widening.

1. Set-back ordinance.
2. Eliminate landscape.
3. Reduce width of sidewalks.

(b) Stop Lights.

1. Eliminate existing 8th Street stop light, and replace with caution type signal.
2. Provide caution type signals at the intersections of 6th and Pine and 11th and Pine Streets.

(c) Parking.

1. Make all parking meters a two-hour duration.
2. Eliminate parking 15 feet from corners as indicated in Part III, Miscellaneous Considerations.
3. Further studies toward eliminating parking entirely, on either east or west side of Pine or

both, during certain hours or certain days.

4. Take positive steps toward creating a system of alleyways, thereby eliminating trucks double parking.

5. Eliminate double parking of passenger vehicles by strict enforcement.

In reference to (c) 1 above, I further recommend that the business establishments of Rolla be granted a courtesy permit which will enable them to allow their out-of-town patrons the privilege of overparking without being penalized.

U.S. 66

(a) Elimination of trucks parking on side streets off U.S. 66 for a distance of 40 feet.

(b) An electric caution signal should be placed at the intersection of 10th and 11th and U.S. 66.

(c) Speed limits should be strictly enforced.

RAILROAD GRADE SEPARATIONS

(a) Recommend overhead at 16th Street.

(b) Recommend overhead at 10th Street.

(c) Recommend underpass at south end of Pine Street.

(d) Improvement of Main Street overhead.

MISCELLANEOUS

(a) Pave Frisco Railroad right of way between 10th and 8th Streets and between 8th and 7th Streets.

(b) Pave Holloway Street its entire length and extend to Salem Avenue.

(c) Widen culvert at south end of Elm Street (See Figure 50).

(d) Remove stop signs at 7th, 8th, and 9th Streets along Rolla Street.

(e) Compel Rolla Bus Line to park their vehicles on 9th Street instead of Pine Street.

(f) Widen east side of Pine Street between 10th and 12th Streets (See Figure 48).

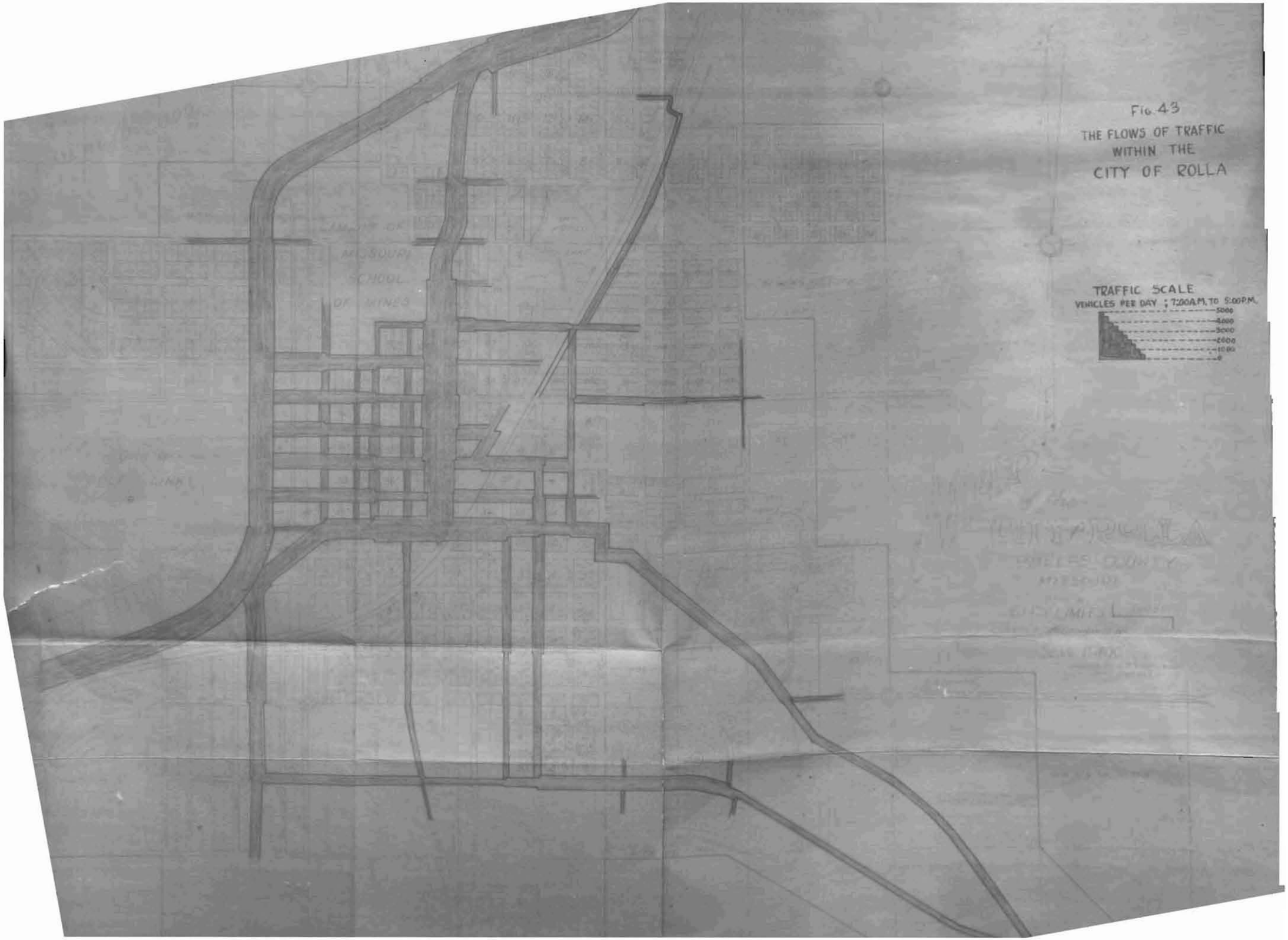


Fig. 43

THE FLOWS OF TRAFFIC
WITHIN THE
CITY OF ROLLA

12th Street Crossing of Frisco Railroad
Looking East.

12th Street Crossing of Frisco Railroad
Looking North along Cedar Street.

Figure 44

18th Street Crossing of Frisco
Railroad Looking East.

18th Street Crossing of Frisco
Railroad Looking East.

Figure 45

Figure 46

Pine Street North
from Frisco Railroad

from Frisco Railroad

Proposed Location of Railway Overhead
11th Street, Looking East.

Proposed Location of Railway Overhead
10th Street, Looking East.

Figure 47

Frisco Railroad Right of Way, Looking
South toward 8th Street

Figure 48a

Intersection of 10th and Pine Streets
Looking North
Showing Non-alignment of Curb Line

Figure 48

Intersection of 11th Street and U.S. 66
Looking East

Figure 49a

Intersection 9th and Pine Streets
Looking East

Figure 49

South Elm Street, Looking South
Failure to Extend Culvert, Creating
Traffic Hazard

Figure 50

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VITA

Leon Hershkowitz was born on November 13, 1903, at Iola, Kansas, the son of Isaac M. and Hattie Hershkowitz.

His early education was received in the grade schools at Iola, Kansas, Kansas City, Missouri, and Collinsville, Oklahoma; and high schools at Tulsa and Collinsville, Oklahoma. He entered the Missouri School of Mines in September, 1922, specializing in Petroleum Chemistry. He left the School of Mines in 1926 to accept a position with the Texas Corporation in their oil refinery at Port Arthur, Texas, as a research chemist. At this time he married Helene, the daughter of Fred and Nellie Strobach of Rolla, Missouri.

He was with the Texas Corporation for a period of one year during which time he was instrumental in developing the first lubricating oil through vacuum distillation.

It was necessary to give up his position with the Texas Corporation and move to a different climate on account of malarial condition that existed in Port Arthur, Texas, his wife having contracted the fever soon after their arrival.

After leaving the Texas Corporation, the depression at that period had begun and good positions were at a premium; so employment was accepted with the St. Louis-San Francisco Railway Company as a rodman. He was with the Railway Company for about one year when he became associated with the

Department of Public Works and Buildings, Division of Highways, State of Illinois. He was with this organization from April, 1928 to June, 1938, during which time he acted in the following capacities: Chief of Survey party; design engineer; estimating engineer; pavement and bridge inspector; resident engineer; and for the period of 1934 to 1938, right of way engineer.

At this time the Civilian Conservation Corps was created by the Federal Government and a request was made and received for a leave of absence from the State of Illinois to enter active service with the U.S. Army in connection with conservation work and he ultimately commanded camps at Toledo and Anawan, Illinois.

In January, 1940, he returned to the campus of Missouri School of Mines to complete his studies, graduating in January, 1941, with a B.S. degree in Civil Engineering.

In June, 1941, he was called to active duty with the U.S. Army, Corps of Engineers in the rank of Captain and assigned to the 43rd Engineer Regiment. This organization took an active part in the Tennessee, Arkansas, and Louisiana maneuvers and after Pearl Harbor was on its way to an overseas assignment. He saw duty in Australia and New Guinea and returned to the United States in October, 1944. He was assigned to duty at Fort Leonard Wood, Missouri, for a period of approximately one year before returning to civilian life.

In January, 1946, he again entered the Missouri School of Mines for graduate work in Civil Engineering and at the same time acted as a graduate assistant in the C.E. Department.

In September, 1946, he accepted a full-time position as Instructor in Civil Engineering.